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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 5.] 1915. [No. 7.

PLAGUE.

KUNHARDT (J. C.), TAYLOR (J.), assisted by GANPATI IYER (R.), KESAVA MENON (T.), VARADHACHARI (B. V.), RAGHAVENDRA RAO (R.) & NARAYAN RAO (K.). **Epidemiological Observations in Madras Presidency.**—*Jl. of Hyg.* Plague Supplement IV. 1915. Jan 1. pp. 683–751. With 7 maps and 30 charts.

This investigation was undertaken by the Indian Plague Commission with the view of finding a solution to the question why the Madras Presidency had, relatively to many other parts of India, only been slightly affected with plague. A previous investigation into conditions in Madras City had shown that the relative scarcity of rats and rat fleas there was not sufficient to account for the immunity of the city, and it appeared probable that the explanation was that the infection had difficulty in reaching the city.

So far as the incidence of plague is concerned, the Presidency may be divided into three zones:—(1) The Bellary district, the Mysore Plateau and the Nilgiri Hills, which have all suffered severely from plague; (2) a zone lying immediately below and around these areas, which has suffered but lightly from plague; and (3) the East Coast and Southern portion of the Presidency, which have escaped the ravages of the disease.

Laboratories were established by the Commission in each of these zones, Denkanikota being selected as representing the Mysore Plateau and the conditions favourable to endemic plague; Coimbatore and Vaniambada were chosen for observations below the Mysore Plateau, while the town of Madura and the earlier observations in Madras City represented the Southern Districts and East Coast respectively, that had all but escaped plague.

The climatic conditions in zone (1) were found to be highly favourable to the spread of plague. Observations taken at Bangalore in the Mysore Plateau, for example, show that except for two months in the year the mean temperature is below 80° F. and during the cold weather below 70° F. The relative humidity for the greater part of the year is above 70 per cent. and from June to September it is above 80 per cent. From the observations made at Denkanikota it appeared that the flea prevalence in the district was high, varying from 14·9 fleas per rat in August to 3·1 fleas per rat in May. The maximum number of fleas was co-related with the greatest number of plague cases. The number of rats caught, per 100 traps set, varied from 27·5 in August, 1911, when trapping observations were started, to 2·6 in August, 1912, when the operations were discontinued.

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The climatic conditions of zone (2).—Coimbatore may be taken as an example of the climatic conditions met with in this zone. The hot weather is very short and the temperature is never very high, while the relative humidity is high throughout the year. The climatic conditions are not unfavourable to the spread of plague infection once the disease has found a foot-hold in the district, infection, when it occurs, usually being derived from the Nilgiris.

The average number of fleas per rat varies from 1·4 in May to 10·4 in September, the height of epidemic plague in the district being reached in August and September. In Vaniambada the flea prevalence attained its maximum about the beginning of January when, approximately, 10 fleas per rat were recorded, the temperature and relative humidity at the time being respectively 72·7° F. and 81·6 per cent. The numbers of rats trapped varied from 14·4 in November to 2·6 in February.

The climatic conditions in zone (3).—As stated, the climate of the town of Madura is representative of the conditions met with in the south of the Presidency. The climate is very hot and dry, the lowest mean daily temperature being 77·7° F. and the temperature is below 80° F. for only seven weeks of the year. The number of fleas found per rat was smaller than in any other district examined, varying from 6·8 per rat in March to 3·5 in April, but the numbers of rats trapped were large, varying from 49·6 per 100 traps in May to 19·9 in July.

It cannot be said that the number of rats and fleas in any of these localities was, in the light of the Commission's experience elsewhere, too small to prevent the development of an epidemic in them. Experiments conducted by the Commission (*Jl. of Hygiene*, Plague Supplement 2, pp. 229–265) have shown that rats caught in certain towns in the Presidency, which have been practically free from plague, are very susceptible to the disease, but that rats caught at Bellary, a town in the Presidency that has suffered severely from plague, are highly immune, thus indicating that conditions exist in the former places which hinder the successful implantation of infection. These conditions are probably to be found in the hot climate obtaining over the greater part of the Presidency. A lowlying hot and dry plain separates the areas at present infected from more humid and cooler coastal regions, especially in the north of the Presidency. Plague has rarely occurred on the East Coast, but on the West Coast the seaport towns of Mangalore and Calicut have suffered from importation of infection from Bombay. The unfavourable conditions in the area mentioned above most probably break the chain of communication between the infected area on the West and the cooler regions on the East coast, as rat fleas when separated from their hosts speedily succumb to the combined effects of a high temperature and drying.

R. St. John Brooks.

HOSTALRICH. **Un Foyer de Peste Bubonique en Annam.**—*Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon* (1913). 1914. pp. 244–255.

The severe epidemic of bubonic plague which occurred in the province of Binhthuân (Annam) from February to August, 1908, claimed over

2,000 victims among the native population. In the chief town of the province, Phan-thiêt, and in the suburb of Phu-trai, 1,100 cases occurred with a mortality of 850.

The virulence of the epidemic is attributed to the insanitary habits of the natives, living as they do in dark and badly ventilated houses with the floors polluted with the remains of decomposing fish and other rat pabulum, the sick remaining in the closest contact with healthy persons.

In the chief town 578 cases occurred, of which over two-thirds were fatal. The majority of those attacked were females, which is attributed to the fact that the native women live in the contaminated dwelling to a greater extent than the men, and are thus more exposed to infection. Out of a series of 294 cases, 264 were bubonic, 19 septicaemic, three pneumonic, one intestinal, and seven ambulatory. Over 71 per cent. of the bubonic cases and all the other cases, with the exception of the ambulatory forms, died of the disease. It is suggested that the infection in the pneumonic cases was started by inhalation of bacilli from clothing contaminated by the excretions of plague rats, or by infection of the mucous membranes by means of infected flies (Diptera). [The possibility of the first pneumonic case being secondary to plague septicaemia is not considered.]

Five grave cases were treated by blood-letting (300 to 500 grams), intravenous injections of massive doses of Yersin's serum (100 cc.) and by intravenous injection of physiological salt solution (1 litre). Three of these desperate cases recovered.

The view is expressed that for Yersin's serum to have any appreciable effect on the course of the disease the first injection must be given within 48 hours from the appearance of symptoms. R. St. J. B.

KURAOKA (H.). **Epidemiological Study of Plague in Formosa.**—*Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon* (1913). 1914. pp. 204–212.

While admitting that the conveyance of plague from rat to rat is largely effected by rat fleas, the author, from his experiences in Formosa, is strongly of opinion that at least one third of human cases are caused by contact with inorganic matter contaminated with plague bacilli, through the medium of wounds. This conclusion is based on the fact that of 734 persons suffering from plague, 181 were found to have cuts or wounds on their bodies, showing a percentage of 24·66, which are assumed to have contracted plague by some other means than the agency of fleas. [It is not very easy to follow the process of reasoning that led to this conclusion, but apparently the argument is that as the wounds were sometimes situated in the same region as the primary buboes, the infection must have been introduced by such channels.]

The author is also of opinion that plague is carried over the off-season in the bodies of animals suffering from "chronic" [resolving] rat plague, and that plague is often conveyed from rat to man by means of the dejecta from plague rats. [Neither of these contentions are sustained by a scintilla of experimental evidence, and they are in direct opposition to the results of years of elaborate and painstaking experimentation carried out by the Indian Plague Commission.]

R. St. J. B.

FLU (P. C.). **Kleine Mededeelingen** [Plague Notes].—*Geneesk. Tijdschr. v. Nederl. Indie.* 1914. Vol. 54. No. 5. pp 570–580.

This short paper comprises notes on the author's observations on epidemic plague in various parts of Java. He describes an explosive outbreak of pneumonic plague which occurred at Toeloe Sajoe and also an epidemic of bubonic plague at Karanglo in which 185 cases were recorded. The distribution of the buboes in this series is of interest as, among the children attacked, in 65·5 per cent. of the cases the primary buboes were situated in the axillary and cervical regions, as against 22·5 per cent. among adult males and 31·7 among women. An explanation for this may be found in the fact that women and especially children, from the nature of their habits and work, are more likely than men to expose the upper portion of their bodies to the bites of plague infected fleas dwelling on the floor of plague infected houses, or that by reason of the fact that they remain indoors for a greater portion of the day than the men, they are more liable to be bitten on the head and shoulders by infected fleas dropping from the roof.

R. St. J. B.

AKIN (Charles V.). **An Epidemiological Study of a Plague Focus.**—*U. S. Public Health Rep.* 1914. Dec. 25. Vol. 29. No. 52. pp. 3468–3471. With 5 figs.

During the outbreak of plague in New Orleans in 1914 a very interesting plague focus was discovered in premises situated in Magazine Street. These premises occupied a very large lot and were in the shape of a great double L (⊢⊢) encircling on three sides an interior court and surrounded on all sides by a brick wall running to the full height of the two stories. Infected rats having been found on the premises, it was marked down for fumigation and rat proofing. During the course of these operations it was observed that at first only *Mus norvegicus* were seen. When the *Mus norvegicus* population had been finally disposed of, *Mus rattus* began to make its appearance and readily became plague infected from the fleas that had survived the death of the ground rats. Infection of the mouse population of the building followed that of *Mus rattus*, as *Mus musculus* dwelt in closer relation to *Mus rattus*, on the second floor of the building, than it had done with the *norvegicus* population, which had mainly inhabited the ground floor. No human cases occurred although people were living over a hotbed of infection. This is explained by the fact that the rat population was so large that human blood did not present any temptation to the rat flea, which apparently did not at any time find any difficulty in procuring a meal from its natural host.

R. St. J. B.

BACOT (A. W.). **Further Notes on the Mechanism of the Transmission of Plague by Fleas.**—*Jl. of Hyg.* Plague Supplement IV. 1915. Jan. 1. pp. 774–776. With 2 plates and 2 text figs.

In this paper the author confirms the previous observations of Bacot and MARTIN with regard to the mechanism of plague transmission by fleas. [This *Bulletin*, Vol. 3, p. 201.] It is pointed out

that even when a passage is cleared through the proventriculus of a flea that has become blocked with a plug of plague organisms, the lost valvular action of the organ is not restored, and that ingested blood can flow out of the flea's stomach just as easily as it enters it.

"In this condition the infection of any animal on which the flea fed would seem to be more, rather than less, likely than in the case of a flea in which the proventriculus is completely blocked. With the existence of a patent proventriculur valve the infected contents of the stomach may, owing to the peristaltic contraction of that organ, be regurgated into the wound on the cessation of the suction of the pharyngeal pump."

R. St. J. B.

BACOT (A. W.). **Observations on the Length of Time that Fleas (*Ceratophyllus fasciatus*) carrying *Bacillus pestis* in their Alimentary Canal are able to survive in the Absence of a Host and retain the Power to re-infect with Plague.**—*Jl. of Hyg.* Plague Supplement IV. 1915. Jan. 1. pp. 770–773.

Collections of 100 to 300 fleas (*Ceratophyllus fasciatus*), after being given opportunities to suck the blood of mice which were in the comatose condition which precedes death from plague septicaemia, were placed in a series of 11 cages, to which healthy mice were added subsequently. In nine of the cages the test mice died of typical pest, but in two cages, Nos. 1 and 8, no infection to test mice occurred within the usual period of three to five days, after which the mice were removed. When the mice, dead or living, had been removed, the cages were covered with waxed cloth, to prevent drying as far as possible, and stored in a cool situation (mean temperature about 45° F.). The cages were then allowed to remain for periods varying from 18 to 73 days without any host for the contained fleas, and when the desired periods had elapsed the waxed cloth covers were removed and two healthy mice were added to each cage. In three of the cages, Nos. 2, 3 and 8, which had been stored for 29, 34 and 47 days respectively, the mice died of pest. The mouse in cage No. 8 did not die until a period of 24 days had elapsed; consequently the period between the original infection of the flea population and the infection of the new host must have been about 67 days. It thus follows that plague infection may persist in fleas for one or two months in the cool weather and, subsequently, give rise to an epizootic.

R. St. J. B.

BACOT (A. W.). **Notes on the Development of *Bacillus pestis* in Bugs (*Cimex lectularius*) and their Power to convey Infection.**—*Jl. of Hyg.* Plague Supplement IV. 1915. Jan. 1. pp. 777–792. With 2 plates and 1 text fig.

Bugs (*Cimex lectularius*) which have become infected by ingesting the blood of septicaemic plague mice are, if they manage to survive the infection, capable of carrying *B. pestis* and reinfecting mice after a period of 48 days. A certain proportion of bugs, however, and probably all newly hatched ones, do not survive the infecting meal and die in a paralysed condition.

The structural character of the ingested blood is preserved for many days in the crop of the bug, and the development of *Bacillus pestis* is slower, and the resulting growth is looser, than is met with in the case of the flea. This taken in conjunction with the fact that there is not any distinct valve between the pump and the crop, precludes the idea of mechanical blockage such as may obtain in flea infection.

One of the difficulties encountered in Bacot's experiments was the eating of the bugs by the mice in the cages. This undesirable state of affairs can be obviated by placing pieces of wood, in which a number of saw-cuts have been made, in the cages. The bugs are thus afforded cover from the attacks of their enemies.

R. St. J. B.

KERANDEL (J.). **Insectivore Réservoir de Virus de la Peste au Cambodge.**—*Bull. Soc. Path. Exot.* 1915. Feb. Vol. 8. No. 2. pp. 54–57.

In this paper is recorded a case of plague infection in a species of long tailed shrew (*Crocidura murina*), the dead body of the animal being found in the neighbourhood of a house in the Chinese quarter of Phnôm-Penh. These animals, which are commonly known among Europeans as "musk rats," are insectivorous in their habits and are frequently found in human habitations, being attracted thither by the insects and larvae furnished by the depôts and reserves of wood. They appear to suffer from a high degree of *Xenopsylla cheopis* infestation, and thus constitute a very real danger in localities infected with plague. The destruction of *Crocidura* ought for these reasons to be recommended in any scheme of anti-plague prophylaxis.

[The Indian "musk rat," *Crocidura coerulea*, is highly resistant to plague, withstanding a subcutaneous dose of one-fifth of an agar tube culture of a virulent strain. The Indian Plague Commission have only noted one case of a "musk rat" which was naturally infected with plague.]

R. St. J. B.

FLU (P. C.). **Muskieten als Overbrengers van Pest?** [Mosquitoes as Carriers of Plague ?]—*Geneesk. Tijdschr. v. Nederl. Indië.* 1914. Vol. 54. No. 5. pp. 540–551. With 1 plate.

The author has carried out a series of researches in order to ascertain if under experimental conditions mosquitoes were capable of conveying plague infection. Experimenting with *Mansonia* (sp. ?) and *Culex pipiens* it was observed that these insects, when hungry, would freely bite infected marmots, experimentally inoculated with virulent plague cultures. Furthermore it was ascertained that the plague bacilli ingested from the septicaemic blood of these animals multiplied in the stomach of the mosquito and that material obtained from the stomach or fore-gut, on inoculation into healthy marmots, could convey plague infection to them. These inoculation experiments were repeated daily and it was found that infective material could be recovered from the alimentary canal of the mosquito up to the fourth or fifth day after the infecting meal. It appeared desirable to repeat these experiments with different species of mosquitoes, as the Mansonia and Culex used would not bite again and died after

the infecting meal, thus prohibiting the crucial experiment—*i.e.* the transmission of the infection by biting. Anopheles and Stegomyia, which are greedy and repeated feeders, would have answered admirably for this purpose, but unfortunately the time of the year in which these experiments were conducted precluded the collection of these insects in sufficient quantities to have given to the results any great significance.

R. St. J. B.

MANAUD (A.). **Observations et Recherches expérimentales sur la Pathologie de la Pneumonie pesteuse.**—*Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon* (1913). 1914. pp. 213–223.

The isolated cases of pneumonic plague which occur in Siam do not appear to have any tendency to cause extension of the disease, and persons coming into intimate contact with such patients do not become infected. Manchurian experience has been very different, for there, pneumonic plague proved to be intensely infective; the bacilli being sprayed about by the patients in the act of coughing, and thus infecting those in the vicinity. It is considered that an explanation of these facts may be that in Manchuria, where the mean temperature is about —20° C., the liquid particles which are coughed out, are immediately frozen and thus acquire a greater penetrating power, while in Siam, where the mean temperature is about +30° C., the minute particles tend to coalesce and are then less likely to be breathed in.

Several experiments were made on guinea-pigs under different conditions of temperature, one series being at —18° C. and another at +30° C. The inoculations were made in the nasal fossa and on the conjunctiva, with drops of emulsions of recent cultures or infected liver. Animals inoculated in the nasal fossa died in from four to five days at the refrigerator temperature and about one day later at the room temperature. In the first series the pulmonary symptoms were the most marked, in the latter series the involvement of the cervical glands. Similar results were obtained with the ocular inoculations.

Typical pneumonic plague was induced in guinea-pigs exposed to aerial infection from frozen pulverized cultures. The results obtained with similar cultures at room temperature varied; in all cases the fatal result was delayed and in a series of three cases involvement of the cervical glands was observed, as in nasal or ocular infection.

R. St. J. B.

ILVENTO (A.) & MAZZITELLI (Michele). **I Casi di Peste curati nell'Ospedale per Malattie Contagiose in Tripoli.** [Plague Cases treated at the Hospital for Contagious Diseases in Tripoli].—*Malaria e Malat. Paesi Caldi.* 1914. July-Aug. Vol. 5. No. 4. pp. 277–296. With a chart.

This communication deals, for the most part, with the clinical history of a series of 55 cases of plague that occurred in Tripoli during a small epidemic in 1913. They were mostly of the bubonic form.

One case was of particular interest, in that the surgeon was accidently inoculated from the contents of a plague bubo and the resulting infection was strictly localized owing to the prompt application of iodine to the seat of injury.

With regard to treatment, anti-plague serum and electrargol did not seem to be of much avail, but injections of iodine in the neighbourhood of the buboes appeared to have some effect in reducing the mortality.

R. St. J. B.

DEGGELLER (O.). **Behandeling van Pestlijders met Intraveneuse Injecties van Formaldehyd-natrium-bisulfurosum.** [Treatment of Plague with Intravenous Injections of Formaldehyde sodium bisulphite.]—*Geneesk. Tijdschr. v. Nederl. Indië.* 1915. Vol. 55. No. 1. pp. 26–34. With a chart.

Following the successful use of Formaldehyde sodium bisulphite (Fonabisit) in cases of pneumonia, puerperal fever and erysipelas, a similar line of treatment has been attempted in the Melang Department of Java in cases of bubonic plague. The complete effect of the drug was unfortunately not obtained, as with delirious patients it was very difficult to inject directly into the vein, the fluid generally escaping into the perivascular tissue, and the effect of the drug was not rapid enough to prevent the fatal termination of the disease.

Three of the five cases treated with Fonabisit in 5 cc. doses died of plague, while the remaining two cases recovered. One of these cases was a very chronic one, and apparently in a hopeless condition at the time of treatment. The case came under observation on the 27th August, 1914, and received one injection of Fonabisit on the 16th October. The patient improved rapidly and was quite recovered by the 25th of the month. It is admitted that the number of cases treated is too small to allow of any definite conclusions to be drawn with regard to the therapeutic value of the drug in plague. In all cases there was a marked increase in the pulse rate after the injection, usually associated with a subsequent fall in temperature.

R. St. J. B.

ROWLAND (Sydney). **Further Experiments on Vaccination against a Body-Strain of Plague.**—*Jl. of Hyg.* Plague Supplement IV. 1915. Jan. 1. pp. 752–753.

In the preparation of nucleo-protein extracts of plague bacilli, the nearer the conditions in the culture medium used for the propagation of the organisms that are to afford an antigen, approach those that obtain in the body of the living animal, the more the efficiency of the antigen against a body-strain is increased.

The following table shows this increased efficiency of the vaccines used, the test being in every case the same, *i.e.* 3,000,000 virulent organisms from a body-strain of plague :—

Strain.	Cultivated	Inoculated on to agar flooded with	No. of rats inoculated.	Percentage which survived the inoculation
Agar	Serum broth	Heated horse serum	47	57
Agar	Serum broth	Serum spleen extract	39	74
Spleen	Fresh horse serum	Serum spleen extract	41	75
Spleen	Fresh rat serum	Fresh rat serum spleen extract	43	84

R. St. J. B.

ROWLAND (Sydney). **Immunisation by Pseudotubercle.**—*Jl. of Hyg.* Plague Supplement IV. 1915. Jan. 1. pp. 754–755.

It has already been demonstrated by Rowland that guinea-pigs can be easily protected against a virulent agar strain of plague by means of vaccination with killed cultures of pseudo-tubercle, but the fundamental difference which exists between agar and serum (body) strains of plague is emphasised by the fact that animals so protected do not exhibit any appreciable immunity when tested against serum strains, only 4 animals out of 28 surviving the test dose of such virulent organisms.

R. St. J. B.

ROWLAND (Sydney). **Immunisation by Living Avirulent Cultures (Strong)**—*Jl. of Hyg.* Plague Supplement IV. 1915. Jan. 1. pp. 756–758.

The Influence of Race on the Efficiency of the Antigen.—*Ibid.* p. 759.

The protection afforded by living avirulent cultures of plague has been the subject of investigation by STRONG. Working with such avirulent cultures (Strong), Rowland has demonstrated that they only possess a slight protective value for guinea-pigs and white rats, when tested against a test dose of 3,000,000 virulent plague organisms from a passed culture (Laboratory strain) that killed 90 per cent. of normal rats. Of 20 guinea-pigs protected with a dose of 10,000 of Strong's organisms, 13 died of plague and of 20 rats, 9 died of plague ; a survival percentage of 35 and 52 respectively. When, however, the avirulent organisms used were grown in a medium containing serum broth, a high degree of protection (73 per cent.) was afforded against the same test dose, even although the protecting dose (200 organisms) was reduced to $\frac{1}{50}$ of the original dose. A nucleo-protein extract prepared from these exalted organisms showed that a considerable deterioration of the antigen takes place during the process of extraction and that the protection value of the vaccine was reduced to 40 per cent.

When rats vaccinated with these exalted living virulent cultures were tested against a culture of moderate virulence, which was obtained from one of CASTELLANI'S Ceylon cases, only 59 per cent. survived the test inoculation. The degree of immunity conferred was not very striking as 50 per cent. of unprotected controls survived the inoculation with the same test dose. Thus the protection afforded by the Strong antigen against the Castellani strain was not nearly so good as that afforded against the Laboratory strain, notwithstanding the fact that the latter was the more virulent. Furthermore, of 49 rats vaccinated with the Ceylon antigen, 36 per cent. survived the test inoculation with the Laboratory strain, while of 47 rats vaccinated with the Laboratory strain antigen and tested with the same strain, no less than 60 per cent. survived. It is concluded that the two antigens are not entirely identical and that cross immunisation is not complete. It is suggested that such differences in antigens may account for the poor result which has been obtained with Haffkine's prophylactic by certain workers in Java.

R. St. J. B.

ROWLAND (Sydney). **On the Failure to Vaccinate against a Virulent Body-Strain even with an Antigen prepared as far as possible under Body-Conditions.**—*Jl. of Hyg.* Plague Supplement IV. 1915. Jan. 1. pp. 760–761.

A culture of plague derived from a virulent agar strain, on being passed and repassed through the bodies of living rats for a period of about 12 months, exhibited a sudden and unexpected rise in virulence. On the death of the rat the spleen organisms were grown on rat-blood agar and subsequently in serum broth. The resulting organisms were so virulent that a test dose of 3,000,000 bacilli killed 100 per cent. unprotected rats in 48 hours, with evidence of plague infection of extraordinary intensity.

Antigens prepared from this super-virulent strain failed to afford significant protection against the same strain of organisms, 38 out of 44 in one case, and 34 out of 49 in another case, succumbing to infection with the test dose. The author is of opinion that "should a strain corresponding to the one with which the above experiments were made be prevalent in a local epidemic, complete failure of any protective inoculation at present known will occur."

R. St. J. B.

ROWLAND (Sydney). **The Protective and Curative Value, against Infection with a Serum Race of Plague, of the Serum of a Horse immunised with Nucleoprotein extracted from a Strain of Plague Bacilli propagated on Serum Protein.**—*Jl. of Hyg.* Plague Supplement IV. 1915. Jan. 1. pp. 762–764.

It has been observed in Bombay that serum prepared by immunising horses against a toxic nucleo-protein derived from a broth (laboratory) strain of plague, when tried in practice in cases of human pest, completely fails to influence the course of the disease. Nevertheless such serum in 1 cc. subcutaneous doses completely protects a series of rats which have received, subsequent to inoculation, a standard test lethal

dose of the same strain of broth organisms, and reduces the mortality from 80 per cent. to 20 per cent. in a series of rats in which a dose of 0·5 cc. of the serum is administered subcutaneously 24 hours after the animals were inoculated with a test lethal dose of the same strain of plague organisms.

Rowland has now shown that a serum can be prepared, using as a source of the immunising toxin a body-strain of organisms and employing the same strain as a test for the efficiency of the serum. The horse used in the experiment received, in all, 1,500 milligrams of nucleo-protein extract, spread over a period of 41 days, and was then bled one litre. 1 cc. of the resulting serum protected 6 rats out of 10 against a test lethal dose of the virulent organisms—100 per cent. of the controls dying from pest. The serum also possessed curative value, in that 1 cc. administered 24 hours after the test lethal dose of the serum race organisms, reduced the mortality from 100 to 30 per cent.

R. St. J. B.

Rowland (Sydney). **Ultraviolet Light as a Germicide in the Preparation of Plague Vaccine.**—*Jl. of Hyg.* Plague Supplement IV. 1915. Jan. 1. pp. 765–769.

In the quest for a method of killing virulent strains of plague without causing appreciable deterioration in the immunising power of the contained nucleo-protein antigen, the bactericidal action of ultraviolet light was employed, but it was ascertained that the killing of the organisms by the radiation from a quartz mercury lamp was accompanied by the destruction of the antigen. The wave length of the rays responsible for the killing was then ascertained, and was found to extend between the line 296 micro mu and the extreme limit of the available spectrum.

It was further ascertained that the absorption spectrum of nucleo-protein extract extended between the same limits. An emulsion of bacilli was then exposed to the entire radiation of a quartz lamp through the action of a solution of the antigen.

Thirty rats were inoculated with a vaccine prepared in this manner, the exposure varying from 5 to 20 minutes. Subsequently tested with a virulent culture, which killed 100 per cent. controls, the whole 30 inoculated rats died from pest. "It is concluded from these experiments that the bactericidal and antigen injuring regions of the spectrum are identical."

R. St. J. B.

Moses (Arthur). **Studien über Immunität bei der Pest.** [Studies in Plague Immunity.] [Also in Portuguese.]—*Mem. Inst. Oswaldo Cruz.* 1914. Vol. 6. No. 2. pp. 100–111.

These studies consist for the most part in a repetition of some of Rowland's work with nucleo-protein extracts of the *Bacillus pestis*, obtained by means of the sulphating process. The antigens which were employed appear to have varied greatly in their toxicity, and it was sometimes observed that a large dose of toxic nucleo-protein had no effect on the experimental rat, while a smaller dose killed the anima

with symptoms of toxaemia. In one instance the smallest lethal dose of the endotoxin was 0·1 mg., the animal surviving an inoculation with ·05 mg. All the animals inoculated with increasing doses up to 0·8 mg. died, but the rat that received 1·0 mg. remained alive.

R. St. J. B.

FLU (P. C.). **Het Uitzwavelen van Dessawoningen als Middel ter Bestrijding van Pest.** [Sulphur Fumigation in Plague prevention.] —*Geneesk. Tijdschr. v. Nederl. Indië.* 1914. Vol. 54. No. 5. pp. 552–569. With 5 illustrations, 1 diagram & 1 chart.

The quick and effective fumigation of peasant dwellings in Java has been accomplished by the author by means of an entirely new method, in which the whole structure to be fumigated is covered with a fabric impregnated with a substance which not only makes it impervious but also protects it from the deleterious action of sulphur dioxide gas.

The fabric used was a kind of "drill" known locally as "Kain Kajoe"; this was employed in rectangular pieces 20 by 15 metres and impregnated with the following mixture:—

Common asphalt	100 kilos.
Petroleum	10 to 15 litres.
Oil of Turpentine	10 litres.

The asphalt was first heated to melting point and then cooled down to 80° C., at which temperature the petroleum and turpentine were added. The impregnation of "Kain Kajoe" was carried out in a trough containing the mixture at a temperature of 80° C., the fabric being conveyed along the sides and bottom of the trough on rollers and the superfluous mixture being mechanically removed by iron scrapers attached to the trough. The prepared material was subsequently rolled up on its long axis and hoisted, by means of ladders, on to the roof of the house that had been selected for fumigation, and then let down on either side of the roof. In skilled hands the whole covering of the house did not occupy more than ten minutes and, when it was necessary to fumigate large houses, two or more sails could be joined together by means of metal clamps. A kind of imitation leather, sold under the trade name of "Ducks Q.O. Colour 22 lether, Grain Bright" was found to be just as efficacious as the prepared fabric, and although the initial cost was greater, it proved, in the long run, to be the more economical.

The employment of crude Japanese sulphur is recommended, and the fumigation of everything in the house should be carried out for at least three hours. This will kill most fleas, and all other ecto-parasites but, as some of the fleas concealed in the flooring are apt to escape destruction, the subsequent use of an efficient floor disinfectant is insisted on.

R. St. J. B.

FLU (P. C.). **Maatregelen ter Voorkoming van Pest.** [Plague Prevention Measures.]—11 pp. With 4 text figs. & 3 diagrams. 1914. Batavia: Javasche Boekhandel & Drukkerij.

In this communication, the author, after briefly going over the evidence in favour of the rat flea as the carrier of plague infection to man, deals with the various methods of combating plague which have been employed as the result of the teaching of experience in special relation to conditions obtaining in Java. As he rightly points out, the essential matter to be borne in mind is the breaking of the connection between man and the rat and its ectoparasites. To this end the efficient rat-proofing of houses is absolutely necessary, and also the protection of food supplies from the attacks of rodents. Particular attention must be directed to proofing of "dead spaces" in walls, roofs and wainscottings and also to the efficient screening of water pipes. Dwellings with pervious roofs, which in all cases should be slanting and not flat, ought to be protected with a covering of sheet iron or tin.

R. St. J. B.

GUITERAS (G. M.). **Plague in Havana.**—*Jl. Amer. Med. Assoc.* 1915. Jan. 2. Vol. 64. No. 1. pp. 29–34. With 3 charts.

This report deals principally with the rigorous sanitary measures which were so successfully adopted to stamp out the small plague epidemic which was introduced into Havana, Cuba, from the Canary Islands in 1912. The routine disinfection of buildings was conducted by fumigation with hydrocyanic gas, the potassium cyanide used being inclosed in three thicknesses of manila paper which were dropped into receptacles containing dilute sulphuric acid. A period of 20 to 25 minutes elapses before the acid solution destroys the paper envelope and the chemical action begins, setting free hydrocyanic acid gas. During this period the operators can complete the arrangements for the fumigation of the premises in perfect safety. For fumigation of small spaces, such as rat holes, an ingenious apparatus was devised by the Chief Quarantine Officer. This consists of a wooden box, 12 by 4 inches containing two litre bottles connected to each other by glass tubing and each in turn to a rubber bulb and outer tube to which a glass nozzle is attached. The bottle to which the rubber bulb is connected is charged with dilute sulphuric acid, while the other bottle is charged with powdered potassium cyanide. By means of pressure on the bulb the acid solution is forced into the cyanide bottle, and the resulting hydrocyanic acid gas passes out through the glass nozzle, which has been fixed with cement mortar into the rat-hole selected for fumigation. Washing floors and walls with phenol disinfecting fluid ("Phenoco") and inundations with mild solutions of phenol disinfectants are recommended as after treatment.

One of the most striking features of the sanitary campaign was the depopulation of 17 blocks of buildings containing two bad foci of infection, and the drawing of a sanitary cordon round the infected area. The depopulation was completed within 24 hours and the zone was thoroughly disinfected block by block. Three weeks elapsed before the zone was opened up and the inhabitants were allowed to return.

R. St. J. B.

Fox (Carroll). **A Further Report on the Identification of some Siphonaptera from the Philippine Islands.** *Treasury Dept. U.S. Public Health Service. Hygienic Laboratory Bull.* No. 97. 1914. Oct. p. 18.

In this paper the author confirms his previous observations with regard to *Xenopsylla cheopis* and *Ctenocephalus canis*, namely that the former is the only rat flea found in the Philippines and that the latter, as in India and Panama, appears to be absent from the Islands.

The previous statement that *Ctenocephalus felis* Bouché, of the Philippine Islands, differed from that of the United States and Europe is here corrected ; " the differences pointed out at the time not being differences at all, but common characteristics."

R. St. J. B.

Wherry (William B.). **A New Bacterial Disease of Rodents transmissible to Man.** *U.S. Public Health Rep.* 1914. Dec. 18. Vol. 29. No. 51. pp. 3387–3390.

A new plague-like disease of the Californian ground squirrel (*Citellus beechyi*) was first described by McCoy in 1911, who in association with Chapin, isolated the causal organism, *Bacterium tularense*, in the following year. The virus was found to be extremely pathogenic to guinea-pigs, rabbits, white rats, grey mice, ground squirrels (*C. beechyi*), the gopher (*C. bottae*) and the Java and Rhesus monkey ; while the adult Norway rat (*M. norvegicus*), the calf, pig, goat, cat, dog and pigeon were found to be immune. Two human cases were subsequently described by Wherry and Lamb, in which with the finding of the causal organism was associated a condition of acute ulcerative conjunctivitis with adenitis of the periauricular and cervical glands, accompanied with high temperature and marked prostration. In both these cases it was shown that the patients had handled and dissected wild rabbits, and as rabbits infected with *B. tularense* were found in the neighbourhood from which one of the cases came, it is reasonable to suppose that infected rabbits were the source of infection.

It is not yet possible to say if infection can be conveyed to human beings through less direct sources than the conjunctiva, but on the basis of animal experiment it seems probable that ulcerative rhinitis, ulcerative or membranous sore throat, gastro-intestinal infection, or lymphadenitis secondary to cutaneous infection may occur. The disease among rabbits is probably very wide-spread throughout Indiana and Kentucky and suspicious cases have also been reported from Ohio. With regard to the natural method of transmission among rodents, the author is inclined to the view of a gastro-intestinal infection, although he admits that it may be possible to transmit the disease by means of infected rodent fleas.

R. St. J. B.

Wayson (N. E.). **Plague and Plague-like Disease. A Report on their Transmission by *Stomoxys calcitrans* and *Musca domestica*.—*U.S. Public Health Rep.*** 1914. Dec. 18. Vol. 29. No. 51. pp. 3390–3393.

The plague-like disease affecting rodents in California, the causal organism of which (*Bacterium tularense*) has been isolated by McCoy

and CHAPIN, appears to be capable of transmission from infected to healthy animals by means of the stable-fly (*Stomoxys calcitrans*) and the common house-fly (*Musca domestica*).

Stable-flies, confined in glass phials covered with a single layer of surgical gauze, were allowed to bite guinea-pigs suffering from *tularense* infection, and subsequently to feed on healthy animals The flies were found to be capable of transmitting infection for one hour after the infecting meal, but after that period successful transmissions could not be obtained. The minimum number of bites necessary for the fly to become infected has not been ascertained, but in the positive experiments the flies were allowed to bite eight times; four bites only not being sufficient to cause infection. Similar results were obtained with stable-flies used in plague transmission experiments.

Tularense infection has also been successfully transmitted by means of *Musca domestica*. The flies were allowed to feed on the 48-hour-old viscera of an animal dead of plague-like disease and then washed in 2 cc. salt solution. One cc. of this washing was injected subcutaneously into a guinea-pig, and death from *tularense* infection occurred on the fifth day after inoculation. Infected flies were also able to transmit infection when permitted to crawl over the conjunctiva prepared by cocainization and traumatized by rubbing a few grains of sand between the ocular and palpebral conjunctiva. The infection of the two human cases, cited by WHERRY [see above], may have occurred in a similar manner.

R. St. J. B.

HOSSACK (W. C.). **A Review of the Eighth Report of Plague Investigations in India.**—*Indian Med. Gaz.* 1914. July. Vol. 49. No. 7. pp. 286–288.

The scope of this article, which is intended as a criticism of the Eighth Report of the Advisory Committee for Plague Investigation in India, may be gathered from a perusal of its final paragraph, which states :—" The final conclusion one must come to is that there is no reason why such volumes as the present under review should not be produced in infinite series, but until the basis of work is somewhat altered they will add little to our knowledge of plague in India."

R. St. J. B.

MARTINI (Erich). **Massregeln gegen die Lungenpest.** [Measures against Pneumonic Plague.]—*Deut. Med. Woch.* 1915. Jan. 1. Vol. 41. No. 1. pp. 12–14.

The author appears to be seriously of opinion that the presence of Indian and other Asiatic troops in close proximity to the German trenches in Flanders and Northern France, carries with it the danger of importation of pneumonic plague. He points out that GOTTSCHLICH recovered virulent plague bacilli from the sputum of a convalescent patient in Egypt on the 76th day after infection with secondary plague pneumonia.

The greater portion of the communication is taken up with a discussion of the means of combating such a hypothetical outbreak, should it arise. It cannot be said that it adds any fresh conceptions to our knowledge of prophylaxis in pneumonic plague.

R. St. J. B.

LISTON (Wm. Glen). **Report of the Bombay Bacteriological Laboratory for the Year 1913.**—24 pp. f'cap. 1914. Bombay: Govt. Central Press. [Plague.]

The portion of this report that deals with plague is concerned with statistics of inoculation, nature of vaccines used, and plague research work.

Further experiments on fumigation by hydrocyanic acid gas were carried out. As a preliminary experiment a small rat-proof experimental godown was filled with bags of rice, and rats were allowed to run freely among them. As the result of hydrocyanic acid gas fumigation, all the animals were killed, no dead rats being found within the grain bags. Fleas in bulk rice do not burrow deeply enough into the rice to escape destruction by the gas, which does not penetrate into bags of rice further than 2 or 3 inches. Half an ounce of potassium cyanide per 100 cubic feet was found to be sufficient to disinfect a barge of a capacity of 12,000 feet; nearly all rats and fleas placed in different situations in the hold being killed after an exposure of four hours to the action of the gas. A considerable number survived an exposure of one hour.

An epizootic was started in a godown, in which a plentiful supply of fleas was introduced along with bundles of old clothing or gunny bags half full of rice. The clothes or gunny bags were subsequently removed to flea-free godowns in which susceptible rats had been installed. It was found that infection was readily carried in the clothing, but no case of plague appeared among the rats that were in association with the grain bags.

Experiments were made to test the efficiency of the treatment of of plague by means of tincture of iodine, either by giving five drops every three hours by the mouth while iodine was applied locally to the buboes, or by injecting 7 minims of the tincture in saline intravenously once in every 24 hours, as recommended by Captain Powell CONNOR, I.M.S. [this *Bulletin*, Vol. 2, p. 72]. The following table shows the results obtained with these methods of treatment and with controls which received the ordinary treatment of the Maratha Plague Hospital; the cases are divided into groups according to the severity of the septicaemia :—

Treatment adopted.	No bacilli in ·25 cc. of blood.		Less than 10 bacilli in ·25 cc. of blood.		More than 10, but less than 100 bacilli in 10 cc. of blood.		More than 100 bacilli in ·25 cc. of blood.		Total treated.	
	Recovered	Died.	Recovered.	Died.	Recovered	Died.	Recovered.	Died.	Recovered.	Died
Controls on ordinary treatment..	3	4	1	1	..	3	..	8	4	16
Iodine administered by the mouth	6	3	2	1	..	1	..	7	8	12
Iodine administered intravenously ..	3	4	..	3	..	3	..	7	3	17
Total ..	12	11	3	5	..	7	..	22	15	45

The number of cases treated in each group is not sufficiently large to allow of any definite conclusion to be made regarding the comparative efficiency of any of the above methods of treatment. The percentage of recoveries are not so high as in the cases reported by Commissioner Booth Tucker as the result of iodine treatment. These cases reported by the Salvation Army probably included some mild cases, whereas all the cases in the above table were suffering from a severe form of the disease. Moreover, the Salvation Army cases came earlier under treatment; in Liston's cases treatment was not commenced until 24 hours or more after the onset of symptoms.

R. St. J. B.

ERRATUM.

Vol. 5. p. 19, line 8—for *Pigiopsylla* read *Pygiopsylla.*

SLEEPING SICKNESS.

OUZILLEAU (F.). **Rapport d'ensemble sur la Maladie du Sommeil dans le Bas-M'Bomou (1912–1913).**—*Bull. Soc. Path. Exot.* 1915. Mar. Vol. 8. No. 3. pp. 138–154.

The author gives a detailed account of the district of Bas-M'Bomou, French Congo, of its flora and fauna, and of its geological characters. The inhabitants can be divided into three great groups: N'Zakara, Yakoma and Zandé. Of these the N'Zakara alone enjoy considerable prosperity and are almost exempt from sleeping sickness. The Yakoma and Zandé countries are on the other hand active foci of sleeping sickness. Owing to the fact that N'Zakara lies between these two infected regions, it is necessary to find some means of limiting the scourge and of preventing it from spreading into the district which has hitherto escaped.

Prophylactic measures were undertaken by the author in March, 1912; the measures adopted were based on the belief, founded on observation, that man is the principal reservoir of the virus, that an infected person is capable of contaminating the district, and finally that an actual and permanent sterilization of the peripheral circulation is obtained by the use of atoxyl.

In order to attain the desired result it was necessary to act quickly, as all delay was marked by a serious advance of the disease which rendered the task to be accomplished longer and more difficult.

If the task was arduous, it did not appear impossible for the following reasons:—

(1) The country of Yakoma is small and limited in the north by an uninhabited zone, so that if the disease could not be exterminated it could at least be prevented from spreading.

(2) Although the country of Zandé was not so circumscribed as that of Yakoma, yet it had the advantage that the inhabitants had been thoroughly examined owing to the fact that they were not very numerous and were subject to authority.

(3) Sleeping sickness is prevalent amongst the labourers and personal servants of Europeans. This constitutes a danger, which has frequently been noted; these people carry the infection to districts previously free such as for example Zandé and N'Zakara. In conclusion the author emphasises the importance of a thorough supervision of the movements of such employees and of efficient treatment of those that are infected.

W. Yorke.

ROUBAUD (E.). **Les Zones à Tsétsés de la Petite-Côte et du Bas-Saloum (Sénégal).**—*Bull. Soc. Path. Exot.* 1915. Mar. Vol. 8. No. 3. pp. 130–137.

The foci of trypanosomiasis on the littoral of Senegal have already been studied by THIROUX and his collaborators. In this paper the author deals with the haunts of *G. palpalis* in the Petite-Côte and defines the belt of tsetse which extends between the estuary of the English Gambia and that of Saloum.

The most important focus of trypanosomiasis in Bas Senegal is that in the vicinity of Nianing. Roubaud made a rapid journey through Thies, Nianing, Ngazobil and Fatick. On this tour he found *G. palpalis* only, but records that *G. longipalpis* was taken by THIROUX and D'ANFREVILLE.*

A general description of the vegetation of the country is given. The palpalis area at Nianing is essentially a Savannah park containing baobabs, ficus, tamarinds and cotton trees, whilst between them is a dense bushy growth, partly zerophilous and partly halophilous, of jujube trees, mimosas, acacias and tamarisks. The fly was found in abundance in the bush as well as in the vicinity of the dry swamp; it was absent only in particularly arid places where thorn trees alone were found.

The author considers the peculiar distribution of *G. palpalis* in the Petite-Côte to be due to the physical characters and geographical orientation of the district.

In addition to the human trypanosome the palpalis of Nianing transmits at least two animal trypanosomes. A kid upon which sixty *G. palpalis* were fed for three days became infected with *T. cazalboui*. Of seven horses examined at Nianing four were infected with *T. dimorphon* and one with *T. cazalboui*; as a rule horses do not survive two winters in Nianing.

Roubaud writes that it would be of great importance to attempt to destroy this focus of trypanosomiasis as it is very prejudicial to commerce, and the area infested is not very extensive. An experimental clearing of shrub had been undertaken previously, but it was on too small a scale. To obtain appreciable results it would be necessary to clear the whole zone between the marsh and the sea.

In the Bas Saloum two species of tsetse were encountered—*G. palpalis* and *G. morsitans*. The former was found in all the mangrove area in Saloum, being especially numerous around Foundiougne; the latter is a veritable scourge in the Bas-Saloum particularly in the province of Niom-Bato which is a very important centre of cattle trypanosomiasis. Niom-Bato lies between the estuary of the Gambia and that of the Saloum. It is essentially a park-like country; villages are rare, and the bush is inhabited by game, especially the larger antelope. That which constitutes the special characteristic of this region is the existence of brackish marshes subject to the influence of the tide. The sea penetrates into the heart of the savannah in the form of narrow fjords fringed with mangroves. At low tide the water recedes from the land on which monkeys, antelopes and crabs can be seen. Apart from this abundant maritime irrigation there is little water. Wells are rare and often at a distance from the villages. After passing the salt swamps *morsitans* becomes rarer and gives place frequently to *palpalis*. The fundamental differences in hygrophilia between the two species is shown in a table; the relative humidity of the atmosphere in the places where *morsitans* was found was between 28 and 50 per cent., as compared with 70 per cent. where *palpalis* was encountered.

No human trypanosomiasis has been found in the Bas-Saloum. As in the Upper Gambia the presence of *G. morsitans* is coincident with

* La Maladie du Sommeil et les Trypanosomiases animales au Sénégal. 1911. Paris: Librairie J.-B. Baillière et Fils, 19, Rue 1 & Autefeuille, 19.

SLEEPING SICKNESS.

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W. Yorke.

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The author considers the peculiar distribution of *G. palpalis* in the Petite-Côte to be due to the physical characters and geographical orientation of the district.

In addition to the human trypanosome the palpalis of Nianing transmits at least two animal trypanosomes. A kid upon which sixty *G. palpalis* were fed for three days became infected with *T. cazalboui*. Of seven horses examined at Nianing four were infected with *T. dimorphon* and one with *T. cazalboui*; as a rule horses do not survive two winters in Nianing.

Roubaud writes that it would be of great importance to attempt to destroy this focus of trypanosomiasis as it is very prejudicial to commerce, and the area infested is not very extensive. An experimental clearing of shrub had been undertaken previously, but it was on too small a scale. To obtain appreciable results it would be necessary to clear the whole zone between the marsh and the sea.

In the Bas Saloum two species of tsetse were encountered—*G. palpalis* and *G. morsitans*. The former was found in all the mangrove area in Saloum, being especially numerous around Foundiougne; the latter is a veritable scourge in the Bas-Saloum particularly in the province of Niom-Bato which is a very important centre of cattle trypanosomiasis. Niom-Bato lies between the estuary of the Gambia and that of the Saloum. It is essentially a park-like country; villages are rare, and the bush is inhabited by game, especially the larger antelope. That which constitutes the special characteristic of this region is the existence of brackish marshes subject to the influence of the tide. The sea penetrates into the heart of the savannah in the form of narrow fjords fringed with mangroves. At low tide the water recedes from the land on which monkeys, antelopes and crabs can be seen. Apart from this abundant maritime irrigation there is little water. Wells are rare and often at a distance from the villages. After passing the salt swamps *morsitans* becomes rarer and gives place frequently to *palpalis*. The fundamental differences in hygrophilia between the two species is shown in a table; the relative humidity of the atmosphere in the places where *morsitans* was found was between 28 and 50 per cent., as compared with 70 per cent. where *palpalis* was encountered.

No human trypanosomiasis has been found in the Bas-Saloum. As in the Upper Gambia the presence of *G. morsitans* is coincident with

* La Maladie du Sommeil et les Trypanosomiases animales au Sénégal. 1911. Paris: Librairie J.-B. Baillière et Fils, 19, Rue 1 & Autefeuille, 19.

VAN DEN BRANDEN (F.). **Seconde Note Préliminaire sur le Traitement de la Trypanose Humaine par Salvarsan-Kupfer.**—*Arch. f. Schiffs- u. Trop. Hyg.* 1914. Nov. Vol. 18. No. 22. pp. 743–758.

An account of the author's preliminary paper was given in this *Bulletin*, Vol. 3, p. 167. The present paper gives the results, chiefly in tabular form, of 43 cases treated. The table, which affords evidence of the care with which the patients were watched, gives in each case the name, sex and weight; the state of the cerebro-spinal fluid before treatment; the amount and date of the injection or injections; the dates on which the blood was centrifuged, with the result; the state of the cerebro-spinal fluid after treatment; and the result of the treatment.

Of the cases with normal cerebro-spinal fluid (*i.e.* less than 5 cells per cmm.) in nine there had been no relapse after 14, 14, 14, 13, 10, 12, 11, 11 and 11 months, and in eight of these cases the cerebro-spinal fluid remained normal [of the ninth there is no information]. This was the result of a single dose (·1–·3 gm.) in every instance but two, in which two doses were given. The number of times the blood was centrifuged with negative result lay between 14 times and 21 times in each case. Other cases had been trypanosome free for shorter periods.

In thirteen other instances in which the cerebro-spinal fluid was normal a relapse occurred after 11 months, 8 months, and lesser periods down to 24 days. One or two injections only had been given. One patient died the day after his injection, another four days later. The dose was in the first case ·3 gm; in the second ·2 gm; both became jaundiced.

Of the patients with altered cerebro-spinal fluid all relapsed and many died.

The author points to the excellence of the results in early cases, having regard to the opinion of BRODEN and others that a patient at the first stage whose blood is sterile eight months after treatment can generally be regarded as cured.

Advanced cases do better with small doses of atoxyl or atoxyl and antimony. Three advanced cases had a series of injections of salvarsan copper, with no benefit. The doses, ·6 and ·8 gm. in all, were well borne.

In his conclusion the author remarks that doses of 0·005 gm. and ·0025 gm. per kilo body weight have given blood sterilisations of long duration and perhaps definitive cure. He recommends that the former dose be not exceeded. He suggests that still better effects may be obtained with repeated doses or in association with other drugs. He thinks that the sodium salt of salvarsan copper will be more convenient for use than salvarsan copper itself, if not more effective.

A. G. B

LANFRANCHI (Alessandro). **L'Oftalmo e l'Intrapalpebro - Reazzione nella Diagnosi e nella Differenziazione di Alcune Tripanosomiasi. Nota Preventiva.** [The Ophthalmic and Intrapalpebral Reaction in the Diagnosis and Differentiation of Trypanosomiasis. Preliminary Note.]—*Bull. Soc. Path. Exot.* 1915. Mar. Vol. 8. No. 3. pp. 112–115.

As a rule it is not possible to arrive clinically at a diagnosis of the

various trypanosomiases of animals; moreover, the various experimental means of differentiation are not easy, some on account of their complexity being hardly practicable, and others are still of questionable value. A simple and certain method of diagnosis which would be of value in practice has still to be found. With this object in view the author made experiments using the ophthalmic and intrapalpebral reactions.

Dogs and horses infected with surra were employed, healthy animals and animals infected with *T. brucei* serving as controls. With the employment of the technique of LEVADITI antigen was prepared from extracts of *T. evansi* in water, alcohol, glycerine, ether and chloroform. The technique employed in the reaction was similar to that commonly used in the case of animals infected with glanders and tuberculosis.

The conclusions are:

Using a glycerine or alcoholic extract of infective trypanosomes it is possible by means of the ophthalmic reaction not only to diagnose surra in the dog but to distinguish this from nagana.

In horses similar results were obtained with the same extract, not only with the ophthalmic but also with the intrapalpebral reaction.

The author intends to ascertain whether, and to what extent, a slight rise of temperature resulting from the intrapalpebral test during an afebrile period in infected horses is diagnostic.

W. Y.

WEBB (E. Clive). **Trypanosomiasis of Donkeys and Mules in the Anglo-Egyptian Sudan. Some results of Transmission Experiments and Arsenical Treatment.**—*Jl. Comp. Path. & Therap.* 1915. Mar. 31. Vol. 28. No. 1. pp. 1–20.

Trypanosomiasis causes heavy mortality among the transport animals of the Sudan. Every year a large number of donkeys and a lesser number of mules examined at the Chief Veterinary Hospital, Khartoum, are found to be suffering from trypanosomiasis; the animals had contracted the infection when on transport work in the Bahr-el-Ghazal province. When seen at the hospital the beasts were almost invariably in an advanced state of the disease; the mortality amongst them has been, so far as can be ascertained, 100 per cent. Besides these many other animals die in the provinces so that it is impossible to estimate the total losses. In mules and donkeys the onset of the disease is insidious and in many cases its course is very chronic.

A description of the parasite is given. It is polymorphic and the author is of opinion that it must be regarded as identical with *Trypanosoma brucei.*

Encouraged by the work of HOLMES [see *Sleeping Sickness Bulletin*, Vol. 2, p. 128], who found that by the administration of arsenic in suitable doses at least 70 per cent. of horses suffering from surra, even when contracted spontaneously and in the last stage of the disease, can be cured, the author decided to give the arsenical treatment an extended trial, and with this object nineteen donkeys and three mules were treated; of this number twelve died and ten (45 per cent.) were discharged as cured. Webb points out that this does not equal the results obtained by HOLMES, but provided the recoveries are permanent

the results are not unsatisfactory. The majority of the animals treated were in a very poor condition when first seen and several of them were *in extremis.* The amount of arsenic given has an important bearing on the results. In the author's experiments the dosage was very severe, but as a rule the arsenic was well tolerated.

Protocols are given in which details regarding the amount of arsenic administered and the result of the examination of the blood and general condition of the animal are reported.

The following are the conclusions:

"Arsenic appears to have a specific action in a large percentage of cases, and clears the blood of trypanosomes.

"In the light of the experiments of Holmes and others, there seems no reason to doubt that a permanent cure may be effected in a large percentage of cases. As the result of my own experiments, I provisionally claim 45 per cent. of cures, but prefer not to make a more definite assertion until these apparently cured cases have been under observation for a longer period.

"The results so far justify a more extensive trial 'in the field,' more especially as no other drug has so far been proved to be of greater value. To obtain successful results one must be prepared for casualties due to individual susceptibility and overdosage."

W. Y.

VELU. **La Maladie de Fez, Trypanosomiase des Chevaux du Maroc. Note préliminaire.**—*Bull. Soc. Path. Exot.* 1915. Mar. Vol. 8. No. 3. pp. 115–117.

Animals affected show all the principal symptoms of trypanosomiasis. The onset is overlooked and the course of the disease insidious. There is progressive feebleness and emaciation which may become extreme, and finally difficulty in walking owing to involvement of the hind legs. Symptoms of secondary importance are digestive disturbances; the appetite is capricious, whilst there may be enteritis and icterus. Slight febrile attacks of short duration are observed from time to time. The disease is not necessarily fatal.

The pathogenic agent is a trypanosome, but the parasite is rarely seen in the peripheral blood of the horses. When seen in the blood of a rabbit the parasites resemble that of nagana or surra. It measured about 20μ in length and always had a free flagellum: the centrosome stains well. The course of the disease in the rabbit was similar to that due to other pathogenic trypanosomes: the animal died in 20 days with the usual symptoms.

The author writes that as the identification of a trypanosome by means of the microscope alone is impossible owing to the morphological similarity of all the African trypanosomes—trypanosomes of the type *cazalboui* and *dimorphon* excepted—he is at present unable to name this parasite. It is evidently not that which causes dourine, but possibly is identical with the trypanosomes which cause Mal de la Zousfana or debab.

W. Y.

ROSENTHAL (Felix) & KLEEMANN (Erich). **Ueber die Einwirkung von mütterlichem und fötalem Menschenserum auf Trypanosomen.** [The Action of Maternal and Fœtal Human Serum on Trypanosomes.] —*Berlin. Klin. Woch.* 1915. Jan. 25. Vol. 52. No. 4. pp. 75–77.

The authors recall that EHRLICH and WECHSBERG made a comparative study of the action of human serum, from the sick and sound respectively, on trypanosomes and showed that when liver disease was present the amount of trypanocidal substances in the serum was considerably diminished. Their own experiments were made with a highly virulent strain of nagana in mice. The foetal blood was obtained from the umbilical cord at the moment of ligature. The experiments showed that the child's serum in comparison with that of the mother is almost wanting in trypanocidal substances—as far, at least, as the quantity of serum used is concerned. The table on page 416 (one of four) illustrates this.

A similar result was obtained with a curative experiment, four infected mice treated with the serum of the mother being forty days free from trypanosomes, whereas of the six mice treated with the same doses of the child's serum only one survived to the seventh day, the others dying on the fourth. In another experiment the child's serum had a definite prophylactic effect, but far inferior to that of the mother. The question is discussed whether the trypanocidal substances develop spontaneously in the foetus or filter through the placenta, without a definite conclusion being reached. An experiment showed that the serum of a six months foetus had no trypanocidal effect. Attention is drawn to the striking curative effect of the serum of a pregnant woman even in very small quantity. In the last period of gestation there seems to be a large increase of trypanocidal substances in the serum.

[NEUMANN (1911) showed that mice treated with the serum of recently delivered women remained for weeks resistant to trypanosome infection (*T. brucei*) (*Sleeping Sickness Bulletin*, Vol. 3, p. 354).]

A. G. B.

BROWN (Wade H.). **Concerning Changes in the Biological Properties of *Trypanosoma lewisi* produced by Experimental Means, with Especial Reference to Virulence.**—*Jl. Experim. Med.* 1915. Apr. 1. Vol. 21. No. 4. pp. 345–364.

The author refers to his previous work [see this *Bulletin*, Vol. 4, p. 271.] "The object of the [present] investigation was to obtain indications of the nature and mode of action of the factors influencing the biological properties of *Trypanosoma lewisi*." It is stated that "the results must be interpreted in a broad sense, as much of the detail requires long and careful study." Full accounts are given of the sources and nature of the strains used, and tabular protocols are appended. It was found that the tendency of rapid passage was to shorten the incubation period. Also, rapid passage of *T. lewisi* tends to advance the time at which multiplication begins in the blood of the rat. Infections of *T. lewisi* are often chronic, but exceptions are not uncommon. "Mere regulation of the rate of passage of the virus

ROSENTHAL & KLEEMANN, TABLE I.—Prophylactic Experiment.

Intraperitoneal Infection. Serum introduced subcutaneously.

Day after Infection.	Serum of Mother.					Serum of Child.					Controls.	
	1·0 cc.	0·5 cc.		0·25 cc.		1·0 cc.	0·5 cc.		0·25 cc.			
	1	2	3	4	5	8	9	10	11	12	6	7
1	0	0	0	0	0	(+)	0	(+)	(+)	(+)	+	+
2	0	0	0	0	0	+	(+)	+	+	++	+++	+++
3	0	0	0	0	0	++	+	++	++	+++	†	†
4	0	0	0	0	0	+++	++	+++	+++	†	—	—
5	0	0	0	0	0	†	+++†	†	†	—	—	—
7	0	0	0	0	0	—	—	—	—	—	—	—
9	0	0	0	0	0	—	—	—	—	—	—	—
11	0	0	0	0	0	—	—	—	—	—	—	—
13	0	0	0	0	0	—	—	—	—	—	—	—
15	0	0	0	0	0	—	—	—	—	—	—	—
16	0	0	0	(+)	(+)	—	—	—	—	—	—	—
18	0	0	0	+++†	+++†	—	—	—	—	—	—	—
22	0	0	0	—	—	—	—	—	—	—	—	—
26	0	0	0	—	—	—	—	—	—	—	—	—

from one rat to another seems sufficient so to alter the biological properties of *T. lewisi* as to change an infection that is usually chronic into one that may be regarded as acute, or vice versa."

In connection with changes in virulence, the author states:—"The basis for estimating the virulence of *T. lewisi* in these experiments was the incidence, especially serial incidence, and degree of such symptoms of intoxication as stupor, weakness, loss of weight, and anemia, together with the mortality definitely attributable to infection with *T. lewisi*; very little account was taken of isolated instances of severe intoxication or even death." Another factor was the time at which the transfer of the trypanosomes was made. There seems to be an interrelation between virulence and morphological variation, the latter occurring mainly in infections of considerable severity. It must be remembered that the transference of relatively large quantities of blood containing but few trypanosomes involves the introduction of an unknown amount of immune bodies. The author notes "two distinct classes of immunological reaction, one of which is concerned in checking the multiplication of trypanosomes, as ordinarily understood, and the other in their destruction." Small rats seemed to be more easily infected than large rats.

The author's summary is as follows:—

"1. Different strains of *Trypanosoma lewisi* represent different states of biological balance, especially between the powers of propagation and resistance to destruction.

"2. The biological status of a given strain of *Trypanosoma lewisi* is subject to cyclic variations as the result of immunological reactions in the blood of the host.

"3. The factors limiting reproduction and causing destruction of *Trypanosoma lewisi* in the blood are appreciably independent of each other. It is possible, therefore, to influence these processes separately and even in opposite directions.

"4. The virulence of *Trypanosoma lewisi*, manifested in its highest form, is dependent upon some degree of reproductive fastness, strong antigenic action, and susceptibility to destruction, varying degrees in the development of these properties producing corresponding variations in the degree of virulence.

"5. By a properly regulated system of passage the properties of *Trypanosoma lewisi* that determine its infection cycle and its virulence may be eventually so altered as to change completely both the nature and course of the infection. Such a system of passage must be adapted to the particular strain of *Trypanosoma lewisi* used.

"6. Immunological reactions exercise a dominant influence in determining the ultimate biological variations of *Trypanosoma lewisi*."

H. B. Fantham.

YAWS.

DAVEY (J. B.). **Observations on Medical Matters in the Dedza District.** [No. 18 Yaws]. *Annual Medical Report on the Health & Sanitary Condition of the Nyasaland Protectorate for the Year ended 31st Dec. 1913.* 1914. Zomba: Printed by the Goverment Printer. pp. 100–103.

These notes were taken by the author during the course of sleeping sickness investigations in that part of the Dedza District (Nyasaland) which lies between the lake shore and the foothills; as will be seen by Table III, on opposite page, yaws is extremely prevalent amongst the natives of this region.

Excluding for the present the Amalawi, whose numbers are too small for comparison, it will be noticed that the Angoni, who may be considered comparatively recent immigrants to this area, show a far smaller percentage of old cases than the other tribes, amongst which there is but little difference; and that the percentage of old cases amongst children is only 25 per cent. less than in adults, which is in accord with the replies received as to age at onset, the average of 469 cases being 11 years. The ages of 57 cases with actual granulomata was also estimated and the average of these worked out to 19 years, even though persons as old as 57 years were included; finally, the percentage of old cases amongst men and women is almost identical.

Out of 464 cases the site of the "Mother Yaw" was 268 times the lower limb and 127 the upper limb, the remainder being on the trunk, head and neck, except two on the genitals. In the vast majority of old cases the character and position of the scars of the granulomata left little room for doubt as to the diagnosis, but of the 464 cases amongst 2,945 persons examined, in 10 only no definite scars could be found.

In 80 out of 394 old cases in men and women firm subcutaneous nodules, varying in size from that of a pea to that of a duck's egg, were found in varying parts of the body, but the favourite site for them was on the subcutaneous border of the ulna, about two inches from the tip of the olecranon process; over the great trochanter of the femur and over the ligamentum patellae and lower part of the patella were also common sites, in the latter situation being sometimes associated with enlarged prepatellar bursa; occasionally they were seen near the malleoli and in one case on the zygoma. These nodules correspond closely to the description of "Juxta-articular nodules" given in works on Tropical Medicine, the cause of which is said to be unknown.* The fact that of 394 old cases of yaws, 55 (*i.e.* 13·96 per cent.) had subcutaneous nodules on the ulna, whereas of the remaining 1,984 persons examined only eight had them, is strong evidence that these nodules are nothing more or less than a manifestation of yaws. They are comparable to gummata but have not the tendency of the latter to break down.

* The works to which Dr. Davey has access are apparently not recent. Juxta-articular nodules are usually attributed to a fungus, a species of Nocardia.—[ED.]

TABLE III.—Showing Incidence of Yaws in Dedza District, Nyasaland.

Tribe.	No. of men examined.	No. of recent cases.	Percentage.	No. of old cases.	Percentage.	No. of women examined.	No. of recent cases.	Percentage.	No. of old cases.	Percentage.	No. of children examined.	No. of recent cases.	Percentage.	No. of old cases.	Percentage.	No. of infants examined.	No. of recent cases.	Percentage.
Yao ..	427	3	0·70	92	21·55	662	11	1·66	135	20·39	276	7	2·54	39	14·13	181	0	—
Angoni ..	244	8	3·28	12	4·92	350	5	1·43	16	4·57	94	1	1·06	1	1·06	120	0	—
Anyanja	193	2	1·04	35	18·19	273	6	2·19	45	16·48	142	7	4·93	17	11·97	65	1	1·54
Amalawi...	8	1	—	3	—	35	6	—	12	—	4	0	—	0	—	15	3	—
Achipeta ..	92	0	—	18	19·57	94	1	1·06	26	27·66	51	0	—	13	25·49	19	0	—
Total ..	964	14	1·45	160	16·6	1414	29	2·05	234	16·55	567	15	2·46	70	12·35	400	4	1·0

Further observations by the author in the Mlanje District tend to confirm the yaws theory of the origin of juxta-articular nodules, an opinion which was previously advanced by MOUCHET and DUBOIS [see this *Bulletin*, Vol. 1, p. 530].

"There is a curious legend about the origin of yaws in this district, where it is said to be a comparatively recent introduction. Two generations ago a man went out fishing on the lake in the afternoon; a very strong wind arose and he was compelled to stay out all night on some rocks. When he left his village he was healthy, but he returned next day covered with yaws and introduced the disease into the district. It is supposed that an evil vapour in the lake caused the yaws. This idea may have been suggested by the appearance of the little masses of rock whitened by guano, which bear no small resemblance to a crop of yaws."

The author's conclusions are as follows :—

"1. Yaws is endemic in the low lying area of the Dedza District adjoining the lake : about 16·5 per cent. of adults have suffered from the diasese.

"2. Males and females are affected in equal proportions.

"3. A large amount of temporary and a not inconsiderable amount of permanent disablement is due to the disease and its after effects.

"4. In about half the cases the disease is acquired before adult life is reached, and it is probably a potent factor in infant mortality.

"5. 'Juxta-articular Nodules' are a late manifestation of yaws.

"6. Gangosa (Rhinopharyngitis Mutilans) probably occurs in Dedza District, but the observations recorded throw no light on its connection with yaws."

E. Hindle.

HOWARD (R.). **The Importance of Tertiary Yaws.** *Jl. Trop. Med. & Hyg.* 1915. Feb. 1. Vol. 18. No. 3. pp. 25–27.

The author has worked for over fifteen years in different parts of Central Africa, between Lake Nyasa and the East Coast in the neighbourhood of Zanzibar. In this paper he calls attention to the frequency of tertiary yaws and points out that this is liable to be mistaken for tertiary syphilis, so that travellers' statements to the effect that the natives are riddled with the latter disease should be received with caution. In many parts of Central Africa nearly 50 per cent of the population have suffered from yaws. Two parts of German East Africa, viz., the Bondé country, 30 miles inland from Tanga, and the region of Newala, 90 miles inland from Lindi, were found to be badly infested with yaws. In the former district the disease seemed to have existed for a long time, but in the latter it seems to be of much more recent introduction assuming almost an epidemic character. In the course of two years over 2,000 cases attended the Mission Hospital for treatment, and a large proportion of them healed under potassium iodide. Left untreated in a native community, primary yaws heals in about a year, but tertiary yaws often steadily advances causing frightful deformities. Rhinopharyngitis mutilans and a special form of leucoderma of the palms and soles are in many instances symptoms of the disease and the author adds notes on these conditions.

E. H.

RINGENBACH (J.) & GUYOMARC'H. **La Lèpre et le Pian dans les Territoires parcourus par la Section française de la Mission de Délimitation Afrique Equatoriale française-Cameroun en 1912–1913.**—*Bull. Soc. Path. Exot.* 1915. Mar. Vol. 8. No. 3. pp. 124–130.

Yaws (*Okon Mabara* among the Pahouins, *Mobaka* in the Yassouas, Yakingas and Indongoes, *Manfouta* in the Boca-Bongas) was found to be common in all the districts visited by the authors. It was especially prevalent amongst children and adolescents. For example in the village of Kata N'Goye there were nineteen patients with yaws, fifteen of which were children. It is also common for all the members of one family to be infected.

The lesions were especially common on the face and in the neighbourhood of the natural orifices of the body. In addition the soles of the feet were sometimes affected and this form of lesion was most difficult to cure.

From the Sangha to the Ibenga the natives employ the same method of treating this disease; it consists in first washing the lesions with warm water and then applying the chopped up young leaves of a shrub (Tingouka among the Yassouas, Lingouka of the Yakingas and Indongos, Manfouta of the Boca Bongas); this plant seems to possess caustic properties and almost invariably cures the patient after one to three months.

The authors obtained good results by painting the lesions twice a day with a 1 in 10 solution of chromic acid, and in many cases the patients were cured within a fortnight.

The authors administered intravenous injections of salvarsan on six occasions but were unable to find out the results of the treatment. The drug was made up in solution before leaving France and the authors state that in this case it is possible to administer injections in the bush.

E. H.

BAHR (Philip H.). **Notes on Yaws in Ceylon, with Special Reference to its Distribution in that Island and its Tertiary Manifestation.**—*Ann. Trop. Med. & Parasit.* 1915. Jan. 29. Vol. 8. No. 4. pp. 675–682. With 1 plate.

The author presents certain aspects of the epidemiology and clinical symptoms of yaws as it occurs in Ceylon. Though widespread in certain clearly defined areas it has a topographical distribution, and cases of yaws in which the original infection was contracted at an elevation of 800 or more feet above sea-level are extremely rare. It is especially prevalent in the Northern and Eastern Provinces and also in the hot damp villages of the Southern Province, whilst in the comparatively cool up-country planting districts the disease appears to be unknown though syphilis is common enough. From various observations the author is of the opinion also that in Ceylon there is developed a reciprocal immunity between yaws and syphilis, for the two rarely occur side by side.

The temperature of the atmosphere seems to be the one climatic factor governing the somewhat restricted distribution of yaws in Ceylon, and the immediate environment may be disregarded as a means of disseminating the virus.

The author then speculates as to the possible mode of distribution and suggests that the causative spirochaete may circulate in the blood stream and be transmitted by some blood-sucking insect whose range is definitely limited by climatic factors or the character of the vegetation. In addition the author calls attention to some of the clinical manifestations of the disease and mentions the following :—acute and chronic periostitis, osteitis, epiphysitis, synovitis, ulceration, and gangosa. The paper is accompanied by excellent photographs of certain of these conditions.

E. H.

CASTELLANI (Aldo). **Note on the Internal Treatment of Yaws.**—*Jl. Trop. Med. & Hyg.* 1915. Mar. 15. Vol. 18. No. 6. pp. 61–63. With 4 figs.

Although salvarsan and neosalvarsan are without doubt the specific drugs for yaws, it is often difficult to arrange for the administration of intravenous injections in out of the way districts and also many patients refuse to submit to any form of injection. For these and other reasons an internal treatment by easily obtainable drugs is much to be desired and the author gives a prescription which has given excellent results in Ceylon. The dose consists of :—

tartar emetic	.. ..	1 gr.
sodii salicyl.	.. ..	10 gr.
potass. iodid.	.. ..	1 dr.
sodii bicarb.	.. ..	15 gr.
water ..	.. ..	1 oz.

Adults and youngsters of over fourteen years are given this dose three times daily, diluted in four times the amount of water ; children of eight to fourteen years are given half doses and younger children one third or less. The active drugs in the mixture are said to be the potassium iodide and, to a much less degree, the tartar emetic. The sodium salicylate seems to hasten the disappearance of the crusts. The presence of the large amount of sodium bicarbonate seems to prevent to a great extent the symptoms of iodism and decreases the emetic properties of the mixture. The mixture was tried in eleven cases given in the above doses for ten to fifteen days, then five to ten days' rest, then another course for another five or ten or fifteen days, and satisfactory results were obtained in fairly recent cases in which the disease had started three to twelve months previously.

Photographs are given shewing the effect of this mixture in the treatment of two of these cases.

E. H.

LE ROY DES BARRES. **Sur l'Emploi du Galyl dans le Traitement du Pian.**—*Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal, Saigon* (1913). 1914. pp. 429–431.

Galyl, or '1116,' was discovered by MOUNEYRAT at the same time as ludyl and has given excellent results in the treatment of yaws. The author found that in Annam the surface lesions of patients treated with this compound began to disappear within two days after an

injection, and after a second injection no patient ever showed any relapse. There is very little general reaction following the injection and in view of its lower toxicity (and also lower price) than salvarsan and neosalvarsan, it is to be recommended for the treatment of yaws.

Some notes on this compound may be of interest. Galyl is a tetra-oxy-diphosph-amino-diarseno-benzene. It is a yellow powder, easily soluble in water, when it forms a brown solution. When kept in a stoppered bottle this solution becomes yellow after about an hour. The substance may be administered either intravenously in isotonic solution, or intramuscularly in oily suspension, but the latter is painful. For the preparation of the solution for intravenous injection the following procedure is recommended by MOUNEYRAT :—

Each capsule contains enough sodium carbonate to cause the solution of all the galyl in distilled water and an isotonic solution is prepared by dissolving 1 gm. of the mixture in 3 cc. of water. The solution is prepared aseptically by placing the necessary quantity of sterilized water in an Erlenmeyer flask and adding the powder gradually, shaking the liquid all the time to prevent the formation of clumps, which retard the solution.

The dose is 0·008 to 0·0085 gm. per kilo. body weight in the adult male and 0·007 to 0·008 in the adult female, but these doses can be increased without causing any inconvenience.

For the treatment of yaws the author practised a first intravenous injection of 0·30 gm. followed by a second of 0·40 gm., the interval between the injections being about eight days. The best time for giving the injection is before breakfast and, if no reaction is produced, the patient can eat without any inconvenience after four or five hours. Occasionally a slight reaction is produced, but as a rule the tolerance is perfect and the patient is merely confined to his room for a few hours.

E. H.

MCDONALD (W.). **Treatment of Yaws by Intramuscular Injections of Salvarsan.**—M.S. Report to the Colonial Office from the Governor of the Leeward Islands. Received April 26, 1915.

Up to the end of December, 1914, the writer treated 286 cases of yaws at the Holberton Hospital, Antigua, by intramuscular injections of salvarsan. In all patients over 14 years of age the full dose (0·6 gm.) was employed; from 4 to 14 years, 0·4 gm., and under four years old, 0·2 gm. The patients were kept in hospital for only three days after the injection and if all right were then sent home to complete the cure. In only one case was it necessary to administer a second injection. In a few patients necrosis occurred at the site of the injection and the necrotic tissue had to be removed.

The author then goes on to compare his method of sending the patients home after three days, with that employed in other hospitals of the West Indies, where the patients are generally kept in hospital until the cure has been completed, an average duration of 21 days. The writer's method enables a larger number of patients to be treated and is very economical, since there is no necessity for a special Yaws Hospital and also the cost of feeding is of course very much less.

In conclusion the writer recommends that the last case in the Island should be hunted up and treated, which will necessitate an efficient medical examination of all school children and infants. Also any cases of yaws from neighbouring islands should be refused admission unless they submit to treatment at the hospital.

E. H.

OZZARD (A. T.). **The Treatment of Yaws by Neosalvarsan.**—*Brit. Guiana Med. Ann. for 1913.* pp. 99–100. With 4 plates. 1914. Letchworth: Garden City Press.

The author has obtained excellent results at Georgetown in the treatment of cases of yaws by means of intravenous injections of salvarsan and neosalvarsan. Four photographs accompany the article and show two typical yaw cases before and after treatment with neosalvarsan.

E. H.

WOOD (Edward J.). **The Occurrence of Yaws in the United States.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Jan. Vol. 2. No. 7. pp. 431–449. With 1 plate.

The author has endeavoured to mention every case of yaws that has been reported in the United States, and in addition adds notes on the history, diagnosis and symptoms of the disease. The paper contains nothing new beyond the record of what seems to have been a case of yaws occurring in North Carolina in a white child born of parents who had never been out of that State.

E. H.

PELLAGRA.

SAMBON (L.). **Report upon Pellagra in the West Indies.** [Received in Colonial Office 9th February, 1915.]

The author calls this paper of 19 pages a short preliminary report, which is to be followed by an extended one. Mention is made of the views of the author and of those in the United States who believe that a parasitic origin of pellagra is likely to prove the correct theory. During the last three months of 1913 the author visited the islands of Jamaica, Dominica, St. Lucia, St. Vincent, Barbados, Grenada and Trinidad, the colony of British Guiana and the Isthmus of Panama, and in all these places he either saw cases of indigenous pellagra, or was informed of their occurrence by the local health officers. In Jamaica and Barbados the disease is said to have been known and correctly diagnosed as early as 1898. In the latter island pellagra has often been confused with sprue and our author now wishes to claim that the disease described by HILLARY there in 1766, and called by him "Aphthoides Chronica" was just as likely to have been pellagra as sprue, though he acknowledges that HILLARY's description has been always accepted as sprue. Under the heading "Pellagra and Sprue—are they identical?" he says "My knowledge of sprue being based almost entirely upon the very unsatisfactory literature of the disease, I do not feel justified in expressing any very definite opinion upon the matter; the two diseases are, in many ways, remarkably alike, yet they appear to be distinct."

He is quite certain that the pellagra of the West Indies differs in no way from the pellagra seen in Europe and America. But he quite correctly points out that the complications and concomitant diseases of pellagra differ considerably in various countries and thus seem to alter the features of the disease.

In the West Indies pellagra may be associated with syphilis, tuberculosis, gonorrhoea, dysentery, ankylostomiasis, yaws, dhobie itch, vitiligo, ichthyosis, gangrene and ulcerative granuloma of the pudenda. A discursive paper is concluded with the suggestion that "many cases of St. Anthony's fire, occurring in Spain and other countries from the tenth to the eighteenth century, were neither erysipelas nor ergotism, but gangrenous pellagra."

F. M. Sandwith.

MCDONALD (W. M.). **Pellagra in Antigua.**—*Lancet.* 1915. Jan. 16. pp. 127–128.

Pellagra was first reported in this island in 1909 and is now recognised as being endemic there. The author met during 1913 with 32 cases at the lunatic asylum and hospital, of which at least 21 originated in Antigua, and 11 died. No cases have so far been reported among the white population; all cases occur among blacks who live chiefly on maize and salt fish. The author rejects the Simulium and the Stomoxys theories and believes that pellagra in Antigua "is caused not by bad food but by deficient food."

He has not been able to find any evidence that the disease is communicable from person to person.

F. M. S.

SILER (J. F.), GARRISON (P. E.) & MACNEAL (W. J.). With the collaboration of H. D. SINGER, P. A. SCHULE, O. S. HILLMAN and others. **Pellagra II. Second Progress Report of the Thompson-McFadden Pellagra Commission of the New York Post-Graduate Medical School and Hospital.** iv.+169 pp.

Many of the papers in this carefully compiled report have been separately published and were reviewed in this *Bulletin*, Vol. 5, No. 1. Other papers are now reviewed in this number. The authors seem to be quite clear that there is no evidence to connect Simulium with pellagra. They carefully consider the theory that a deficiency in some special dietary constituent may cause pellagra, but they are unable to accept this theory entirely as may be seen from their conclusions :—

" 1. Pellagra spread from a pre-existing case as a center in the six villages here studied.

" 2. It was transmitted to new victims only through very short distances and chiefly to those immediately associated in the home with a pre-existing case of the disease.

" 3. Frequent use of corn-meal as an article of diet was not a factor in the causation of pellagra in these villages.

" 4. There was discovered no evidence that canned goods have anything to do with the causation of pellagra.

" 5. Frequent use, even daily use, of fresh meats and of eggs afforded no relative protection from pellagra in these villages.

" 6. The daily use of milk seemed to diminish to some extent the danger of contracting pellagra in these mill villages in 1912 and 1913, although its use did not fully insure against the development of the disease."

F. M. S.

JENNINGS (Allan H.). **Summary of Two Years' Study of Insects in Relation to Pellagra.**—*Jl. of Parasitology.* 1914. Sept. Vol. 1. No. 1. pp. 10–21.

The author is one of the staff of the United States Government Bureau of Entomology, and this paper is chiefly based upon his work in cooperation with the Thompson-McFadden Commission in 1912–1913. His conclusions are as follows :—

" Our studies have led us to believe that ticks, bed-bugs, mosquitoes, fleas, horseflies, and, in the absence of further and more incriminating evidence, the lice, may be dismissed from consideration as transmitters of pellagra ; that there is not only insufficient evidence to incriminate flies of the genus *Simulium*, but much evidence directly opposed to such incrimination and that the biting stable-fly, *Stomoxys calcitrans*, shows in marked degree those characteristics of distribution, habit and association with man which would pre-eminently fit it to be the vector of pellagra if transmission of the disease by a blood-sucking insect is shown to be possible.

" If pellagra is found to be an intestinal disease of bacterial origin, house-flies and others of similar habits will in all probability be found to be an active factor in its causation."

F. M. S.

PAGE (B. W.). i. **Etiology of Pellagra.**—*Med. Record.* 1915. Jan. 2. Vol. 87. No. 1. Whole No. 2304. p. 22.
ii. **Etiology and Treatment of Pellagra.**—*Southern Med. Jl.* 1915. Feb. Vol. 8. No. 2. pp. 116–117.
iii. **The Use of a Microscope in the Diagnosis of Pellagra.**—*Amer. Jl. Public Health.* 1915. Jan. Vol. 5. No. 1. pp. 57–58.

Writing from Lumberton, North Carolina, the author claims in these three papers to have discovered a "bacillus which may be the cause of pellagra." It is said to have been present in large numbers in the contents of the large intestine of 53 pellagrins, and it "has not been seen on examination of healthy individuals and those suffering from other diseases." "It is motile, aerobic, sporogenous, stains readily and grows on culture media."

Only "mild intestinal affection was produced in a cat," but in a man pellagra is said to have been induced by transference of cultures of the bacilli. The man suffered, we are told, from pharyngitis and bronchitis within three days, followed by definite intestinal and nervous symptoms of pellagra, whereupon "the microscope revealed the organism in its many forms." These forms are said to be spore, spirillum and bacillus.

F. M. S.

SANDERS (T. E.). **The Organism probably causing Pellagra.**—*Southern Med. Jl.* 1915. Mar. Vol. 8. No. 3. pp. 207–208.

The author found in the spinal fluid of two pellagra corpses in Arkansas an organism which he now believes to be identical with that described by Dr. B. W. PAGE. Dr. Sanders found the same organism in the spleen of a third case, and also in the faeces of several pellagrins suffering from diarrhoea.

F. M. S.

BLOSSER (Roy). **Some Observations further incriminating Sugar-Cane Products as the Main Cause of Pellagra in the South.**—*Southern Med. Jl.* 1915. Jan. Vol. 8. No. 1. pp. 33–36.

This author has written three previous papers upon this subject. He believes that pellagra may be due to a one-sided diet and he has great faith in administering three drops, gradually reduced, of "fluid extract of gelsemium, T.I.D."

His claim that sugar is responsible is based upon the following conclusions :—

"(1) All but three of the 133 pellagrins whom I have questioned admit having eaten sugar-cane products very freely.

"(2) Exclusion of all partially refined sugars and sugar-cane syrups from the diet of pellagrins has enabled us to cure 121 out of 133 cases treated ; of the remaining 12, eight were improved and four died, a mortality of 3 per cent.

"(3) Recurrences have not occurred in any cases in which the diet was carried out as directed ; slight recurrences developed in five cases, but in each of these it was found that the patients had previously relapsed into their former diet."

F. M. S.

Clark (H. C.). **Observations in Tropical Pathology. 1. A Brief Analysis of Thirty-Seven Fatal Cases in which Pellagra has been pointed out alone or in Association with other Diseases.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. Dec. Vol. 2. No. 6. pp. 378–408.

This is an analysis of 37 cases diagnosed as pellagra, taken from 4,020 post-mortem records. Thirteen of the cases were negroes from Jamaica, besides seven from Barbados.

The author from a survey of the clinical notes and the post-mortem findings accepts 12 of the 37 cases as certainly positive, and seven others as doubtful.

The accepted cases varied in age from 21 to 76, and it is significantly pointed out that none occurred among the children. "Nearly all the individuals were either employed as housewives, domestics or in some public building, save for a few outdoor labourers." The diet of the individuals consisted chiefly of vegetables, fruit and fish; the fish taking the place of the meat usually eaten by other races on the Panama Isthmus.

The chief diseases found in association with pellagra were "syphilis, excessive chronic alcoholism, arteriosclerosis, starvation, chronic pelvic inflammations and various types of chronic intestinal inflammations."

[In very few cases were the brain or spinal cord examined microscopically.]

F. M. S.

Ciarla (Ernesto). **Il Problema Etiologico della Pellagra alla Luce della Nuova Dottrina sulla Amerositosi.** [The Etiological Problem of Pellagra by the Light of the new Doctrine of Unilateral Nutrition.] *Riv. Pellagrolog. Ital.* 1915. Mar. Vol. 15. No. 2. pp. 18–21.

This paper begins with an elementary treatise on deficiency of nutrition and it is suggested that "merositina" is a preferable word to vitamine. The rice experiments producing polyneuritis gallinarum are briefly mentioned, and also scorbutic symptoms occurring in guinea-pigs which have been fed exclusively on dried food without fresh vegetables. The writer argues by analogy that pellagra may be due to a one sided diet and should be prevented by improving and varying the food consumed by peasants. He writes from a pellagrous centre near Milan.

F. M. S.

Singer (H. Douglas). **Mental and Nervous Disorders associated with Pellagra.**—*Arch. Intern. Med.* 1915. Jan. 15. Vol. 15. No. 1. pp. 121–146.

This paper forms a part of the Second Progress Report of the Thompson-McFadden Pellagra Commission and is the result of the examination of 164 unselected cases. The author seems to accept the general idea that pellagra is especially a disease of the nervous system, and also that the "disease is extremely frequent among the chronic insane, most of whom represent late stages of the dementia

praecox personality." Curiously enough he has not so far seen pellagrins of the general paralytic type. His general conclusions are as follows :—

"1. Mental disturbance occurs in about 40 per cent. of all cases of pellagra. Such disturbances are more frequent with repeated attacks. Children are practically exempt. They are most common in men between 21 and 40, and women about 41 to 60.

"2. About 95 per cent. of the mental disorders are the direct result of the pellagrous intoxications, and although the mortality in such cases is much higher than in cases without such disorder, yet the mental disturbance will fully recover if the patient survives. They correspond to similar disturbances in other somatic diseases and in such case are often described as not 'insanity.' The remaining 5 per cent. are examples of mental disorder primarily dependent on the individual's make-up. or else are merely concomitant.

"3. Faulty nervous organization, including inadequate mental adaptability, seems to be associated with a predisposition to pellagra. This seems to afford the most satisfactory, even if only partial, explanation of the extraordinary frequency of pellagra arising among the insane, the increased frequency of functional psychoses and psychoneuroses and of nervous disease of the congenital anomaly type among pellagrins as compared with more normal individuals.

"4. Chronic 'insanity' due strictly to pellagrous intoxication, if it occurs, is rare.

"5. Chronic nervous disease as the result of pellagra, if it occurs, is exceptional."

F. M. S.

VERGA [Ercole). **Note Pellagrologiche. Localizzazione non Comune dell' Eritema Pellagroso. Onicogrifosi in Soggetti Pellagrosi.** [An Uncommon Site for Pellagrous Erythema. Affection of the Nails in Pellagrins.]—*Riv. Pellagrolog. Ital.* 1915. Jan. Vol. 15. No. 1. pp. 1–5.

The author cites several writers who have stated ever since the days of Gaspare CASAL that the pellagrous rash usually spares the palms of the hands and the nails and distal phalanges of both hands and feet. But he has found that some of the chronic pellagrins in his lunatic asylum may have an erythema of at least one palm and that 18 per cent. of 50 lunatics had decided affection of the finger nails, while 24 per cent. had similar "dystrophy" of the toe nails.

F. M. S.

FRAZER (Thompson). **The Dermatitis of Pellagra.**—*Jl. Cutan. Dis. including Syph.* 1915. Apr. Vol. 33. No. 4. (Whole No. 391). pp. 311–312.

This is a brief note, accompanying three photographs of early eruptions in their first attack. The author hopes that dermatologists and others may find them useful in throwing light upon otherwise obscure cases of dyspepsia, diarrhoea or neurasthenia.

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F. M. S.

GREIL (Gaston J.). **Pellagra in Children, with Preliminary Report of Cases in Montgomery, Ala.**—*Southern Med. Jl.* 1915. Jan. Vol. 8. No. 1. pp. 29–33. With 5 figs.

A record of six cases selected from 32 pellagrous children who have been under the author's care at two dispensaries in factory districts. The 32 cases ranged in age from two to twelve years, and are said to have presented well-marked symmetrical skin lesions. [This would not be suspected from the bad reproductions of the photographs.] All the cases improved after better food, aided by arsenic in gradually increasing doses. Nearly all the 32 patients suffered also from hookworm disease (uncinariasis).

F. M. S.

DE PROBIZER (Guido). **Einige praktische Bemerkungen über einen Fall von pellagrösem Erythem.** [Some Practical Remarks on a Case of Pellagrous Erythema.]—*Dermatol. Woch.* 1914. Oct. 24. Vol. 59. No. 43. pp. 1207–1212. With 2 text figs.

Writing from the Rovereto pellagra asylum, the author comments upon Professor MENSE's statement that patients already suffering from seborrhoea are more likely to be attacked by pellagrous erythema than other patients. The case quoted is that of a girl with ordinary pellagrous symptoms after eating maize, who also had eczema of the external genitals and leucorrhoea. The author considers that light will be thrown upon obscure problems by publishing notes of all cases.

F. M. S.

BEESON (Carles F.). **The Thyroid Gland in Pellagra.**—*Jl. Amer. Med. Assoc.* 1914. Dec. 12. Vol. 63. No. 24. p. 2129.

The author, in North Mexico, found that in a woman of 45 years the thyroid gland increased in size when pellagrous symptoms were pronounced, and diminished when the symptoms were less evident. He asks whether this is an accidental or a causative phenomenon.

F. M. S.

VOLPINO (G.) & BORDONI (E. F.). **Sopra il Nostro Metodo di Terapia Eziologica della Pellagra.**—*Riv. Pellagrolog. Ital.* 1915. Mar. Vol. 15. No. 2. pp. 21–23, & *Pathologica.* 1915. Mar. 15. Vol. 7. No. 153. pp. 130–131.

This is a report of another case from Turin which improved after four months subcutaneous injections of an aqueous extract of maize. It is also reported that the previous cases published have remained fairly well.

F. M. S.

DE ANGELIS (Giovanni). **Sulla Presenza dello Streptobacillus pellagrae (T) nelle deiezioni di Pellagrosi.** [The Presence of the Streptobacillus of Pellagra in the Faeces.]—*Malaria e Malat. d. Paesi Caldi.* 1915. Jan.-Feb. Vol. 6. No. 1. pp. 27–33; Mar.-Apr. No. 2. pp. 57–77.

This paper is written from Professor TIZZONI's laboratory in Bologna by one of his assistants and is based on the examination of two patients. One guineapig died with diarrhoea, emaciation and spastic paralysis, 43 days after some dilute faeces from a pellagrin were introduced into the stomach by a catheter, while a second guineapig died with diarrhoea and loss of weight, 34 days after it had been similarly treated with faeces from the first guineapig. The author's conclusions briefly are: that it is possible to find in the faeces of a pellagrin the same micro-organism which can be found in his blood, that this can be passed through guineapigs and can also be cultivated on gelatine. Although he agrees with TIZZONI that the micro-organism adopts great variation of form in the blood, according to the various phases of the patients' condition, he finds that only one of these forms is present in the faeces, as shown by some good photographs.

F. M. S.

TIZZONI (Guido). **Per la Dimostrazione nel Sangue dei Pellagrosi dello Streptobacillus pellagrae. Nota di Tecnica Batteriologica.** [The Demonstration of the Streptobacillus of Pellagra (Tizzoni) in the Blood of Pellagrins.]—*Riv. Pellagrolog. Ital.* 1915. Jan. Vol. 15. No. 1. pp. 6–9. With 2 figs.

The Professor suggests that the failure of so many other workers to find this streptobacillus is because it is essential that the pellagrous blood shall be absolutely sterile. He therefore gives careful instructions how the blood is to be drawn from a vein at the bend of the elbow and says that it is necessary to sterilize the skin, not only by cleanliness but also by making use of tincture of iodine. The two engravings show the flasks, connected by sterilized rubber tubing, in which the blood is cultured with veal or horse broth. He quotes the result of some experiments made in Russia in 1914 which he claims as somewhat confirmatory of his discovery.

F. M. S.

HILLMAN (Oliver S.) & SCHULE (Paul A.). **Further Observations on the Blood Count in Pellagra.**—*Arch. Intern. Med.* 1915. Jan. Vol. 15. No. 1. pp. 147–149.

This is a paper from New York in continuation of one by Dr. Hillman which was reviewed in this *Bulletin* [Vol. 3. p. 310].

A table is given of the differential leucocyte counts of 46 pellagrins from Spartanburg County, who were investigated by the Thompson-McFadden Pellagra Commission in 1913. Lymphocytosis is the predominant feature, but the non-pellagrins in pellagrous regions are also found by the authors to have a moderate relative lymphocytosis,

occasioned probably by a general debility, or by some mild gastro-intestinal disturbance. The average age of the patients was 35 years. The average blood count gave 58·8 polymorphonuclears, 34·5 lymphocytes, with little cytoplasm, 2·2 large mononuclears, 1·1 transitionals, 2·8 eosinophils and 0·8 basophils. The authors do not agree that pellagra is associated with a relative increase of large mononuclear leucocytes; their figures ranged from 0·50 to 7·20.

F. M. S.

Ramoino (Paolo). **Contributo allo Studio delle Alimentazioni incomplete. Nota III. Ricerche sulle Alimentazioni Frugivore.**—*Pathologica.* 1915. Apr. 1. Vol. 7. No. 154. pp. 158–161.

The author has experimented on different series of seven or eight guineapigs, fed on maize, rice or wheat flour. All the animals lost weight and eventually died. Those fed entirely on maize lived 31 days while those partially on maize lived only 13 days. Those fed entirely on rice lived 40 days, and 10 days when partially fed on rice. Those which lived entirely on wheat lived longest, 45 days, while those fed on an incomplete wheat diet lived 14 days. In spite of these unlooked for results the author still believes in the "vitamine" theory.

F. M. S.

Fidanza (F.). **Sugli Effetti dell'Alimentazione Umana con Prodotti Maidici.** [The Results of Feeding Men on Maize.]—*Ann. d'Igiene Sperimentale.* 1914. Vol. 24. (N. Ser.). No. 3. pp. 507–517.

The author experimented on two men, a peasant who had eaten maize all his life, and a servant, aged 32, who is said never to have made use of maize food. Careful measurement was made of faeces and urine, when they were subjected to maize diet and to ordinary diet, and it was found that more uric acid and nitrogen were eliminated while on an exclusive maize diet. The writer is convinced that maize has less nitrogenous value than wheat.

F. M. S.

MISCELLANEOUS.

TODD (John L). **Tick Paralysis.**—*Jl. of Parasitology.* 1914. Dec. Vol. 1. No. 2. pp. 55–64.

The author notes that the symptoms of this disease suggest infantile paralysis, but that in no instance has tick paralysis left permanent disability. He gives details of several cases recently reported from British Columbia and Montana, which show that an elevated temperature, rapid pulse and respiration and other constitutional symptoms are not infrequent. A series of experiments was made with the object of producing paralysis in laboratory animals by the bites of ticks. The technique is described. Three monkeys, seven lambs, a guineapig and three puppies were employed, and numerous *Dermacentor venustus.* In many cases the tick became engorged but paralysis never occurred, though some of the ticks had been taken from cases of the disease. Experiments were also made to see whether an extract capable of producing paralysis in laboratory animals could be obtained from the bodies of the ticks. Ticks were ground up in a solution of glycerine or normal saline; the mixture was shaken and filtered and the filtrate was introduceed into rats and in one instance a lamb (five experiments); paralysis never followed. Other experiments were made to ascertain whether an anti-coagulin existed in the filtrate of extracted ticks. It is concluded that :—

"The paralysis of children is not infrequently accompanied by elevation of temperature and by other constitutional symptoms; it is possible that symptoms resembling those observed in children sometimes may appear in adults who have been bitten by ticks.

"Under experimental conditions by no means every tick bite produces paralysis in laboratory animals.

"A weak extract of ticks will not cause paralysis when injected into white rats, even though it possesses definite power to prevent the coagulation of blood."

A. G. B.

STRICKLAND (C.). **Note on a Case of "Tick-Paralysis" in Australia.**—*Parasitology.* 1915. Mar. Vol. 7. No. 4. p. 379.

A boy of eleven got a tick in his ear while in the bush. Four days later he felt sick and giddy; later he could not walk without assistance and his face was on one side. The tick was removed and ten days later the child was well. The tick was not identified. NUTTALL writes that this may well have been a case of tick paralysis.

A. G. B.

SEHEULT (R.). **Note on a Case of Goundou.**—*Lancet.* 1915. Jan. 9. p. 72.

The patient was a negro girl who came to Trinidad from Tobago at the age of four. A small swelling was noticed on both sides of the child's nose four years later, three years before she was seen by the author. No history of yaws or syphilis could be obtained. Both tibiae were distinctly thickened. The author says that this is the

first case of goundou he has met with in twenty years' practice in Trinidad. The disease has been reported by STRACHAN in a Jamaican child. Yaws is prevalent in Tobago.

A. G. B.

McCARRISON (R,). **The Distribution of Goitre in India.** *Indian Jl. Med. Research.* 1915. Jan. Vol. 2. No. 3. pp. 778–790. With a map.

The author has collected details of the prevalence and distribution of goitre in almost every part of British India, with the object of throwing light upon the etiology of the disease. The distribution is set forth in a spot map. It is seen that goitre is widely prevalent over the whole of Himalayan and Sub-Himalayan India, and extends plainwards on the west as far as the junction of the Indus with the Sutlej and on the east as far as the junction of the Ganges with the Brahmaputra. South of the Sutlej and the Ganges the disease occurs much more sparsely. The author notes, again, that it is excessively common in those parts of India drained by the great Indian rivers, the Ganges, the Brahmaputra and their tributaries, as well as in the northern part of Burma drained by the Irrawaddy and the Salween.

While goitre is found in many of the mountainous parts of India it is not present in all, nor does it prevail with equal intensity in every inhabited part of a given range in which it is endemic. It is extensively distributed in the plains. It prevails at an altitude from 10,000 feet downwards. A consideration of its geological distribution shows that it chiefly occurs on rocks of the post-tertiary and archaean groups. There appears to be little connection between the rainfall and the prevalence of goitre, but the disease is believed most commonly to commence and most rapidly to develop during or after the rains. The author suggests that this may be due to inundation, contamination of drinking water by surface washings, etc.

Goitre is most prevalent in regions "where the mean annual temperature is the lowest recorded for the whole of India, that is to say, where this temperature does not rise above 77·5° F." It is almost unknown in the hottest parts of the peninsula. The disease is well-known to prevail with the greatest intensity in temperate and sub-tropical climates. The author is inclined to attach considerable importance to atmospheric temperature. The marked association with rivers is very striking; it is chiefly the case with those in the north of India, but is true to a less degree of many of the smaller rivers of the southern part. The disease is believed to show a tendency to progress along the course of canals.

In the part of Bihar and Orissa traversed by the Ganges, reports are unanimous that north of the river goitre is very rife, while south of the river it is very sparingly met with. Reasons for this are discussed. It is stated that north of the Ganges the prevalence of goitre is facilitated by several factors—the water-logged state of the country, the insanitary state of the villages and the greater area under wet crops. These conditions do not obtain in the area south of the Ganges. "Swampy, sodden lands, where the soil and water contain much organic matter, of human or animal origin, provide the ideal

conditions for the development of goitre." The incidence of the disease is chiefly among the poorest and lowest class of India and in cultivators of the soil. It is much more prevalent in rural than in urban districts. The distribution in goitrous localities is strikingly unequal. The author says that goitre appears to be more common in animals living in swamps of the Gangetic plains than elsewhere. It is very rare in children under eight and is much more common in women than men.

Reports have been received from several districts stating that the waters of certain wells are notorious for their supposed goitre producing properties. Other waters are reported to be capable of curing goitre. Some of these have been analysed and found to contain iodine. The author believes that these waters possess the curative properties attributed to them. He recalls that the addition of small quantities of iodine to the water in which trout suffering from thyroid hyperplasia are living is sufficient to cause a very rapid disappearance of the hyperplasia (GAYLORD). He himself holds that the action of iodine is due to its germicidal properties rather than to any effect on metabolism. All research has demonstrated, he writes, that no known chemical ingredient of water is capable of causing the disease.

A. G. B.

i. FRICKS (L. D.). **Rocky Mountain Spotted Fever. A Report of its Investigation and of Measures undertaken for its Eradication during 1914.**—*U. S. Public Health Rep.* 1915. Jan. 15. Vol. 30. No. 3. pp. 148–165. With 3 maps.

ii. COOLEY (R. A.). **The Spotted Fever Tick** (*Dermacentor venustus* **Banks) and its Control in the Bitter Root Valley, Montana—A Review.**—*Jl. Econom. Entomol.* 1915. Feb. Vol. 8. No. 1. pp. 47–53.

i. This Report is mainly concerned with (1) measures for the control and eradication of the disease in the Bitter Root Valley, Montana, and (2) a study of its distribution.

It is noted that the inhabitants now generally avoid the woods and uncultivated ground during the tick season or protect themselves if they have to go there. This must not be lost sight of in estimating the effect of the tick eradicative measures. These comprise :—

" (1) The reclamation and cultivation of arable land.
" (2) The burning over of the foothills.
" (3) The killing of wild animals.
" (4) Hand picking and the dipping of domestic animals in arsenical dips.
" (5) Sheep grazing."

During 1914 carbon bisulphide pumps were extensively used for the destruction of ground squirrels. The destruction of small wild animals in conjunction with other eradicative measures seems to have had a marked effect. At the beginning of the season three dipping vats were in operation. Horses, cattle, and sheep were dipped in arsenical solution every ten to fourteen days, a total of 2,615 animals between April and June. Observations show that dipping alone is insufficient to eradicate the wood tick. Sheep grazing is discussed at some

length. Its advantage is that no great labour or expense is entailed as in the case of the other measures. Flocks of a thousand and five hundred sheep were used. They were searched frequently for ticks, and it was estimated that 25,000 were destroyed during the season, more than 50 times the number destroyed by the dippings. "It is believed that this experiment shows conclusively that a high percentage of the total adult tick infestation can be destroyed by sheep grazing in one season," but the author goes on to show that the conditions are specially favourable in the Bitter Root Valley and that the same does not apply to other parts with different topographical features.

The distribution of the disease as at present known is shown in the map.

Map of the Mountain and Pacific States showing Distribution of Rocky Mountain Spotted Fever.

ii. The relationship of the tick to the host in the various stages, the habits and abundance of the host animals, and the relation of the development of the tick to the succession of seasons are here reviewed.

The larvae and nymphs use very much the same mammals as hosts; practically all the small mammals occurring in the valley serve, but especially the ground squirrel, the pine squirrel and the chipmunk. The adults feed with few exceptions on large animals, that is to say, in the Bitter Root Valley, domestic animals. These facts have an important bearing on eradication. Domestic animals can be kept free of ticks by dipping and other means, and if the tick is prevented from engorging and laying eggs it must die out. The first persons who studied this tick believed that it completed its life cycle in one year. It is now shown that the life cycle is at least two years and, seeing that adults which fail to secure a host during the first season following nymphal feeding do not die but go down to the ground till July and come up again the next year to wait for a host, it is apparent that the cycle may be three years or more. These facts show that eradicative work must be very complete. It is difficult to get all owners of stock to dip; the author remarks that if spotted fever affected the animals instead of man it would apparently be less difficult to secure the owners' co-operation. He believes that squirrel destruction is desirable only in combination with dipping. The work on sheep as tick destroyers is in an experimental stage. Finally he states that bringing the spotted fever tick under complete control will require some years. Educational work among the people must be first pushed.

[A summary of our knowledge of *Dermacentor venustus* Banks is given by NUTTALL in *Parasitology*, Vol. 7, pp. 425–430. He states that the name is still *sub judice*.]

A. G. B.

BREINL (A.) & YOUNG (W. J.) **The Occurrence of Lead Poisoning amongst North Queensland Children.**—*Ann. Trop. Med. & Parasit.* 1914. Dec. 15. Vol. 8. No. 3. pp. 575–590. With 2 charts.

In 1892 attention was drawn to a disease amongst children living in the neighbourhood of Brisbane, which was attributed to lead poisoning. The symptoms in ten cases were, paralysis of the extensor muscles of the fingers, the long extensors of the toes, the tibialis anticus, and certain muscles of the thumb. Electrical examination showed a well-marked reaction of degeneration in the paralysed muscles. The blue line in the gum was only rarely seen. In four cases there was a history of gastro-intestinal seizures and constipation. In four others there were symptoms of meningitis with squint and double optic neuritis. Other cases have since been reported. The records of the Children's Hospital in Brisbane showed that in 1898 to 1903 85 cases of lead poisoning were treated as in-patients.

Within the last year the authors in Townsville have examined chemically the urine and faeces of a number of children clinically suspected to be suffering from lead poisoning; the results have proved that lead poisoning is a not uncommon occurrence among children. In the excreta of 22 children examined for the presence of lead the metal was found in 18. The cases may be classed according to the severity of the symptoms. In the very early cases there is a change in the character of the children; they become peevish and fretful; they are restless at night and lose their appetites. A history of slight

pains in the epigastrium and pains in the legs can be obtained. Later the abdominal pains become more continuous and constipation is the rule; the pains in the calves become more marked and the calf muscles are very painful. The blue line is observed only in a very small percentage. Many of the cases show foot- and wrist-drop. The nerves of the legs are affected first, thus differing from the cases in adults, where drop foot is rarely present. The patients have a characteristic gait. Brain symptoms are common, "ranging from obstreperousness and fretfulness to a stage resembling mania." The body temperature is often normal throughout; the pulse rate is invariably high, as is shown in two charts. Anaemia is only marked in cases of long standing. The prognosis in the early stages is good. The complaint becomes more serious in the second and third attack; in many instances these patients remain crippled for life, in spite of careful treatment.

It is now believed that lead salts are mainly excreted in the intestine and eliminated with the faeces. The faeces were therefore examined as well as the urine; in every case a larger quantity of lead was found in the faeces, and it was often present there when no trace could be detected in the urine. The method of examination is detailed. The quantities of lead found are given in tables, the cases being classed according to the severity of the symptoms.

As to the source of the poison there is doubt. The alternatives seems to be, inhalation of dust containing lead and ingestion from the biting of finger nails. The authors remark that it is striking that cases similar to those described should not have been reported from other parts of the tropics where lead paint is employed.

A. G. B.

ZOJA (L.). **Su di una forma ancora insufficientemente conosciuta di anemia acuta febbrile con itterizia ed emoglobinuria (il favismo). 1a Nota sul reperto ematologica.** [On a hitherto insufficiently known Form of Acute Febrile Anaemia with Icterus and Haemoglobinuria (Favism). Note 1, on the Haematological Findings.]—*Malaria e Malat. Paesi Caldi.* 1914. Jan.-Feb. Vol. 5. Pt. 1. pp. 2–5.

GASBARRINI (A.). **Su di una forma ancora insufficientemente conosciuta di anemia acuta febbrile con itterizia ed emoglobinuria (il favismo). 2a Nota. Ricerche Sierologiche,** [No. 2, Serological Researches].—*Ibid.* 1915. Jan.-Feb. Vol. 6. Pt. 1. pp. 1–11.

These two important papers are devoted to the discussion of a curious and but little known form of disease which occurs in Sardinia and perhaps in other Mediterranean countries. It is always attributed by the sufferers to the eating of fresh beans, either raw or cooked, or even to the scent of the flowers of the bean when in blossom. [Presumably the bean meant is the ordinary field-bean, *Vicia faba*; the species is not stated.] The disease does not occur at any other period of the year than that of the ripening of the bean, by which fact it is distinguished from black-water fever, which otherwise it much resembles in its symptoms. The patients can generally be proved by microscopical examination of the blood to be exempt from malarial infection, and have not usually been recently taking quinine.

In the second of these two papers the clinical histories are given of ten cases, 7 of them being in children of ages ranging from 2 to 9 years, while the remaining 3 were in adults. Of the children four died, while all the adults recovered.

The symptoms supervene within a few hours of the ingestion of the beans, or of being exposed to the scent of the flowers, and consist of a marked and acute febrile anaemia, the number of red cells often falling to two millions per cubic millimetre, and the haemoglobin to 20 per cent. of the normal. The patient becomes icteric and severely ill. The spleen and liver are but little, if at all, enlarged but the liver may be tender to pressure. The urine contains free haemoglobin, urobilin and indican, but the serum of the blood is clear and limpid and contains no haemoglobin. There may be vomiting of bile, and the stools are bilious. Children may die in a few days, but adults usually recover, and convalescence is speedy, the blood showing evidence of rapid regeneration of the formed elements in normoblasts and megaloblasts. Deviation of complement to malarial antigen is usually quite negative. Susceptible patients may have repeated attacks of the disease.

Manifestly the symptoms of favism are clinically very similar to those of blackwater fever, but the usual antecedents of the latter affection, in the shape of malaria and medication with quinine, can be quite definitely excluded. The disease has been described by FERMI in a work published at Turin in 1905.

J. B. Nias.

BARLOW (Nathan). "**Mal de Boca**".—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. Oct. Vol. 2. No. 4. pp. 274–276.

The author states that tropical infectious stomatitis is recognised by the natives of Central America as a definite clinical entity under the above name. They often state that they contracted it from using the same spoon or drinking glass as a person already infected, and the author agrees that it is transmitted by direct or indirect contact. It has a wide range in Northern Mexico and cases have been seen from all parts of Honduras, Nicaragua, Guatemala, Salvador and Panama. The author regards a rather delicate spirochaete as the most probable cause. He gives the following account of the symptoms :—

"The gums are usually first involved in the neighbourhood of the incisors. They are swollen, spongy, and very tender. Soon a whitish pellicle forms over the involved area, especially marked at the edge of the gums, where it may give the appearance of a purulent exudate. There is, however, but little secretion from the lesions—the saliva always flows abundantly. The process extends superficially much more rapidly than in depth, often attacks the cheeks and lips at the points of contact, and in advanced cases may involve the hard and soft palate, and even the tonsils. The pellicle separates later, leaving an eroded surface, which very gradually deepens. The roots of the teeth may be exposed, but the periosteum is never attacked. In advanced cases there is great debility from pain and lack of nutrition from inability to eat. There are no other constitutional symptoms. The lymphatic glands of the neck are enlarged."

He gives the points of distinction from Rigg's disease, mercurial stomatitis, noma, sprue, scurvy, thrush and tuberculosis. The condition is often found in patients who have active syphilis ; it

becomes worse under anti-syphilitic treatment. The milder forms recover if left to themselves ; the severe form may persist indefinitely. The process is not purulent. In the severe forms it is necessary frequently to paint the entire affected area with a strong solution of an organic silver preparation, *e.g.*, 5 per cent. protargol or 40 per cent. argyrol every hour.

A. G. B.

VANDALA (P.) & AREZZI (F.). **Su Tre Casi di Bubbone Climatico a Mazarrà S. Andrea (Messina).** [On Three Cases of Climatic Bubo at Mazzara S. Andrea (Messina).]—*Malaria e Malat. d. Paesi Caldi.* 1914. Sept.-Dec. Vol. 5. No. 5–6. pp. 343–347, & *Lavori d. Soc. Ital. di Patologia Esotica.* 1914. pp. 178–183.

An account of three cases of climatic bubo in persons who had never been out of Sicily, one being an itinerant vendor of plants, the second a telegraph official, and the third the wife of the latter, who was an elementary schoolmistress. Cases of climatic bubo have been already reported by GABBI from Calabria and Sicily.

J. B. N.

LEBER (A.) & v. PROWAZEK (S.). **Chetnot manenghenng hâlum-tano. (Die kalte Waldkrankheit der Chamarro.) Ein Beitrag zur vergleichenden Psychiatrie und zur Kenntnis des Amok.** [The Cold Forest-Disease of the Chamorro.]—*München. Med. Woch.* 1914. Jan. 13. Vol. 61. No. 2. pp. 60–64.

Under the above title the author describes a form of nervous disease, which is met with among the natives of the Ladrone and Marianne Islands in the Pacific. The patients would appear to be exclusively young men or boys.

The disease begins in adolescence, and is characterized by sudden attacks of unconsciousness, which often come on out-of-doors when the patient is at work, and are therefore attributed by the natives to possession by spirits dwelling in the woods ; hence the name of "wood-disease." The seizures last for various periods ranging from a few minutes to 12 or 24 hours, and are not as a rule, apparently, accompanied by convulsions, though they may occur. There would appear to be in many cases an aura, taking the form of figures, or perhaps of voluptuous sensations. Temporary aberrations of intellect, taking the form of delusions of persecution, are apt to follow these attacks, and the sufferer is then likely to seize an axe or other weapon, and do mischief, until secured. In the intervals the intellect remains more or less normal.

The disease has manifestly many analogies with epilepsy, and with what is described as "Amok" in Malaya. Five cases of the condition are described at length by the author, and a bibliography of works relating to the subject is appended.

J B. N.

RAFAEL RISQUEZ (Jesus). **El Bicho o Rectitis Epidémica de Venezuela.** [El Bicho, or Epidemic Rectitis].—*Gaceta Med. de Caracas.* 1914. July 31. Vol. 21. No. 14. pp. 145–148.

The author draws the attention of Venezuelan practitioners to a disease which goes under various names, but is described by MANSON in his textbook of Tropical Diseases as *Rectitis gangrenosa epidemica.* It affects negroes chiefly and appears to have been originally imported from Africa in the time of the slave trade. The author himself has seen but one possible case of the disease, in the person of a negro girl, nine years of age. In that case the patient was in the habit of passing a large number of trichocephalus worms, and to these at the time the symptoms were attributed. Few cases of the disease come under the notice of regular practitioners in Venezuela, because it is usually capable of treatment with domestic remedies, like enemata of lemon juice or tampons of pounded ash-leaves impregnated with lemon juice. Plugging of the rectum with soot is also an approved remedy with the laity.

J. B. N.

BALFOUR (Andrew). **Tropical Problems in the New World.**—*Trans. Soc. Trop. Med. & Hyg.* 1915. Jan. Vol. 8. No. 3. pp. 75–108. With 5 plates.

This is a most interesting paper. It is discursive but seldom gets away from "tropical problems," and unlike some other valuable productions which come under the reviewer's eye it can be read in an armchair. Dr. Balfour's wanderings occupied six months, in which time he visited Barbados, Grenada, Trinidad, Ciudad Bolivar on the Orinoco, La Guaira on the Venezuelan Coast, and Caracas, Curacao, Maracaibo in the gulf of that name, Porto Colombia, the Magdalena river and Bogotá, the little known Rio Atrato, Cartagena, Colon, Jamaica, Cuba and other less well-known places.

One of the problems is the absence of anophelines, and consequently of malaria, from Barbados. Why are they not introduced by small craft from neighbouring islands? It is suggested that they board these vessels but are swept away by the wind, but Balfour evidently is dubious. A photograph of a swamp shows that the conditions for breeding are apparently good, though the natural breeding places are few. A "back-swimmer" of the genus *Notonecta* [sometimes known as water boatmen] he found to "fasten on culex and stegomyia larvae, which they grip as a spaniel grips a rabbit and then engulf tail first"; he suggests that they play a part in keeping pools free from larvae. Culex and Stegomyia abound; "it is amazing to see the lethargy and indifference with which the mosquito question is treated" by all but the medical officers.

Grenada brings Dr. Balfour to a discussion of the "Poor Whites." He describes the children as sturdy, well-nourished and good-looking, save when infected with hookworm and malaria. Tuberculosis is the chief cause of mortality in the island. At Trinidad he remarks on the apparent absence of kala azar from this island and Jamaica, though streams of East Indians pour into both colonies, and reverts to the possibility of howler monkeys (*Alouatta sinicula*) serving as

carriers of yellow fever [see this *Bulletin*, Vol. 4, p. 154]. The subject is discussed at some length. It is stated that Mr. URICH, Entomologist to the Board of Agriculture, saw monkeys lying dead before the last epidemic of yellow fever in Trinidad, but did not associate the two events. It is not yet known whether the indigenous monkeys of South America are subject to the disease ; AGRAMONTE's unsuccessful inoculations were made on Old World monkeys. It is also noted that the distribution of the Alouatta corresponds fairly closely to that of yellow fever in South and Central America. Balfour suggests experimental work to test the validity of these ideas, which he believes may explain certain disease outbreaks.

A lurid picture is given of the hospital at Bogotá, 9,000 feet above the sea. It dates from 1770. "In one of its courtyards stands the dissecting room."' "Patients lay in rows upon the floor of the wards." "All kinds of cases were mixed up, owing to lack of space, despite the protests of the medical staff." At Bogotá a photograph was obtained of a milk-can and hog wash barrel on the same donkey at the door of a hotel. In this country it is stated that sanitary conditions are well nigh non-existent. In the Cauca valley, Western Colombia, pinta of every kind and colour was exceedingly common [see paper by STRONG, below].

The paper is well illustrated by a selection of the lantern slides shown, which includes a Janthinosoma carrying the eggs of *Dermatobia hominis*. They are more ventrally placed than in the illustration published in this *Bulletin* [Vol. 2, p. 528].

A. G. B.

STRONG (Richard P.). **Recent Investigations in Relation to Infectious Diseases in South America.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Jan. Vol. 2. No. 7. pp. 465–472.

This was a lantern slide demonstration of the results of the first expedition of the Harvard School of Tropical Medicine in 1913. The author and his colleagues, TYZZER, BRUES and SELLARDS first stopped at Kingston, Jamaica. They proceeded to Colon and Panama and thence to Buenaventura in Colombia on the west coast of South America, a very insanitary spot. The author writes :—

"A large proportion of the inhabitants suffer with skin diseases, of which caraate is by far the most common. In this disease pigmented patches appear upon the skin. Sometimes these are slightly raised from the surrounding skin, at other times there is no visible elevation. The patches are usually dry and sometimes slightly roughened or even scaly. In some instances confusion with vitiligo can be avoided only by the microscopic examination of scrapings from the skin. Sometimes both vitiligo and caraate exist in the same individual. The patches in the cases observed varied in colour, being sometimes dark or steely blue, at other times black in colour. Microscopical preparations and cultures of the fungi from the skin were made in a number of these cases after partial disinfection of the skin. The cultures were never pure, and from our studies it appears that apparently several fungi may enter into the etiology of the disease which in all of its manifestations, at least, must be considered at the present time somewhat obscure. Further investigations will shortly be undertaken regarding this disease."

Apart from leprosy and syphilis three types of chronic ulceration were met with on this coast—espundia due to leishmania, phagedenic

ulcer, and a third of blastomycotic origin. Thence they went to Guayaquil, with a population of 80,000, "at the present time one of the most unsanitary cities in the world." Cases of yellow fever occurred almost daily. They were "unable to detect any bodies which suggested a parasitic nature in the blood of this disease." A species of Linguatula was found in a crocodile.

From Guayaquil they went to Callao, and then to Lima. A large amount of the work of the expedition was carried on in the interior of Peru. The diseases chiefly studied were verruga peruviana, Oroya fever, and uta. Verruga they found to be due to a virus which can be transmitted to several of the lower animals (rabbits, dogs, monkeys) and produces definite skin lesions in them. The virus shows similarities to that of small-pox. No visible micro-organism could be detected. It was shown that monkeys could be immunised. In Oroya fever there are no lesions on the skin. The cause is a parasite of the red corpuscles, it is both round and rod-shaped and has received the name *Bartonella bacilliformis*. The endothelial cells of the lymphatic glands are greatly swollen and "it appears that one stage of the life cycle of the parasite is passed within these cells."

The rest of the paper deals with uta, a very old disease of Peru, due to a species of leishmania (see this *Bulletin*, Vol. 3, p. 142).

[Caraate is given by Castellani and Chalmers as a synonym of pinta, which is attributed to fungi belonging to four genera.]

A. G. B.

Petzoldt. **Kasuistische Mitteilungen aus der Praxis.**—*Arch. f. Schiffs- u. Trop. Hyg.* 1914. Vol. 18. No. 24. pp. 811–813. With 1 text-fig.

Four cases are briefly described: a case of syphilitic chancre on the everted lower eye-lid; a case of tabes dorsalis in a leper (Lepra mutilans), with no history of syphilis; a case of tabes dorsalis in a native; and two cases of blennorhea with panophthalmitis. All the patients were natives of Ukerewe, German East Africa.

A. G. B.

Degorce (A.). **Contribution à l'Etude des Tumeurs chez les Annamites du Tonkin.**—*Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon* (1913). 1914. pp. 432–451.

The statistics of the native hospital at Hanoi for the years 1906–1912 inclusive give 444 cases of malignant tumour among 70,649 patients, or 6·28 per mille; 299 cases were in men and 137 in women, but twice as many men as women were patients. The author proceeds to discuss the cases of tumour which he has himself seen. His conclusions are to this effect:—

The study of tumours occuring in the Annamites has failed to reveal histological varieties which have not already been described, but the relative frequency of tumours in the various organs and regions presents some peculiarities that are worth reporting.

As regards the skin, fibroma and different varieties of epithelioma are specially observed; generalised neuro-fibromatosis is fairly frequent.

Cancer of the breast is much rarer than in Europe. One is struck by the extreme rarity of epithelial tumours of the mouth, pharynx, oesophagus and intestine. Cancer of the stomach is observed much less often than in Europe and this relative rarity may be contrasted with the extreme frequency of ulcer of the stomach and of the region of the pylorus. Primary cancer of the liver is extremely common in man. Cancer of the penis is the most frequent of the cancers observed; the vulva and neck of the uterus are much more rarely attacked. Fibroma of the uterus is very rare; cysts of the ovary are frequent.

Tumours of heterotypic origin are observed fairly often in regions with a mixed embryological history; amongst others may be mentioned mixed tumours of the salivary glands and branchiomas of the neck. The orbit is the seat of tumours of which some seem to develop at the expense of the blood vessels. Goitres, developed at the expense of the thyroid body or of aberrant thyroids, are observed almost exclusively in women. The anterior lateral region of the neck is fairly frequently invaded by malignant glandular tumours of the type of lymphocytomas; these tumours have been observed only in men.

In our present ignorance of the real causes of tumours it is impossible to understand the reason of these localisations in the Annamites. Certain peculiarities may be attributed to organic predisposition peculiar to the race, to the mode of life, or to diet, but one may suppose that special parasitic infections, the nature of which is unknown to us, play an important part in the production of these tumours.

In the discussion on this paper MONTEL remarked that at Saigon (Cochin-China) malignant tumours of the mouth, lips and tongue formed 30 per cent. of such growths. Le ROY des BARRES pointed out that the difference might be due to the different manner of using tobacco. The Tonkinese smoke water pipes; the Cochin-Chinese cigarettes. Both chew betel nut and tobacco.

A. G. B.

BOBEAU (G.) **Importance des Affections Mycosiques en Cochinchine. (Note préliminaire).**—*Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon* (1913). 1914. pp. 62–64.

The author in Cochin China has been struck by the number of instances in which he found pathogenic fungi in tissues obtained from the dead house or operating theatre. In his experience, in natives mycoses produce chiefly cellular or tissue lesions, leading either to tumours or loss of substance, whereas in Europeans they are found accompanying organic diseases such as liver abscess and dysentery.

In the native, pseudo-epithelioma of the penis is relatively very common. It was formerly treated by amputation, but since Bobeau's discovery of the mycotic origin the disease has yielded to iodide. Various mycoses of the skin have also been encountered.

In the case of Europeans he has found, in sections, the so-called walls of hepatic abscesses literally felted with mycelium and a similar mycelium in sections of the edge and floor of ulcers of the intestine. In one instance the mycelium was between the serous and muscular coat opposite to an ulcer, and the appendix also was invaded; the lungs and pleura were infected as well. In three cases the vessels were blocked in places with mycelium, the probable origin of the metastases. The author is seeking to establish why these fungi are present in dysentery and liver abscess, and whether they are pathogenic or merely saprophytes.

A. G. B.

VAN DEN VRIJHOEF (H. C.). **Mastisolverbanden in de Tropen.** [Mastisol as a Dressing in the Tropics.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1914. Vol. 54. No. 6. pp. 718–724.

The author recommends "mastisol" as a preparation for use in the tropics, as a substitute for leucoplast and collodion. The perspiring and moist skin of residents in the tropics causes applications of these two substances to become quickly detached. Mastisol is free from this objection. If the edges of a wound are painted with a thin layer of the solution and a layer of lint with the woolly side downwards is then applied, an excellent adhesive dressing is obtained. The composition of mastisol has been described by van TIENHOVEN in the number for May 23, 1914, of the *Nederlandsche Tijdschrift voor Geneeskunde.* It is a proprietary substance, the export of which from Germany has been forbidden during the present war, and the author therefore gives several receipts for the preparation of a similar solution. The two which have given him the best results are:—

(1) after von NORDMANN,

Mastic in tears	20 grammes.
Benzol	50 ,,
Linseed oil	20 drops.
Colophonium resin	10 grammes.
Venetian turpentine	7 ,,

Dissolve in the benzol, and keep in a corked bottle, as a rubber stopper is dissolved by the benzol.

(2) after van ITALLIE,

Mastic	20 grammes.
Colophonium	20 ,,
Castor oil	3 ,,
Benzol	56 ,,
Salicylate of methyl (oil of winter green)	1 part.

Mix.

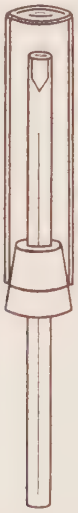
Benzol is preferable to chloroform or alcohol, as a solvent, because it does not cause pain, when applied to a wound.

J. B. N.

WERNER (H.). **Ein neuer Stuhlentnehmer.** [A New Instrument for obtaining Stools.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Apr. Vol. 18. No. 8. pp. 290–291. With 1 text fig.

The author refers to the difficulty experienced by consultants in obtaining portions of stools for examination when dysentery or intestinal parasites are suspected. The patient must be sent home and told to bring a stool, which may, owing to long standing, be useless for examination. Even in hospital it is often of importance to be able to examine fresh faeces at once. ESCHERICH and SATO have devised methods for obtaining stools. The author formerly used SATO's instrument, a glass rod with two holes bored through near one

end. He has now improved this by having the rod hollowed out in the form of a beaker. It can be protected by a glass cylinder with a rubber stopper (see diagram), but this is not necessary. The instru-



ment does not render the examination of naturally evacuated stools superfluous. The author has sometimes obtained a positive result thus, when the specimen brought out by the instrument was negative, and *vice versa*. The rod is smeared with a little glycerin or vaselin, inserted 5–8 centimetres, and moved to and fro. It can readily be sterilised and the hollow can be cleaned with a small brush. It can be obtained from the firm Schattschneider at Hamburg.

A. G. B.

LIST OF REFERENCES.

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For the benefit of recipients of the Bulletin who wish to make a **Card Catalogue,** or to preserve a consecutive record of the references on any subject, **galley proofs** [' *Korrekturbogen* ' ; ' *Première* '] of the **Quarterly Lists of References** (printed on one side of the page) can be supplied at the subscription price of **Two Shillings** per annum. They are obtainable from the beginning of 1914 onwards. Application should be made direct to the Bureau.

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